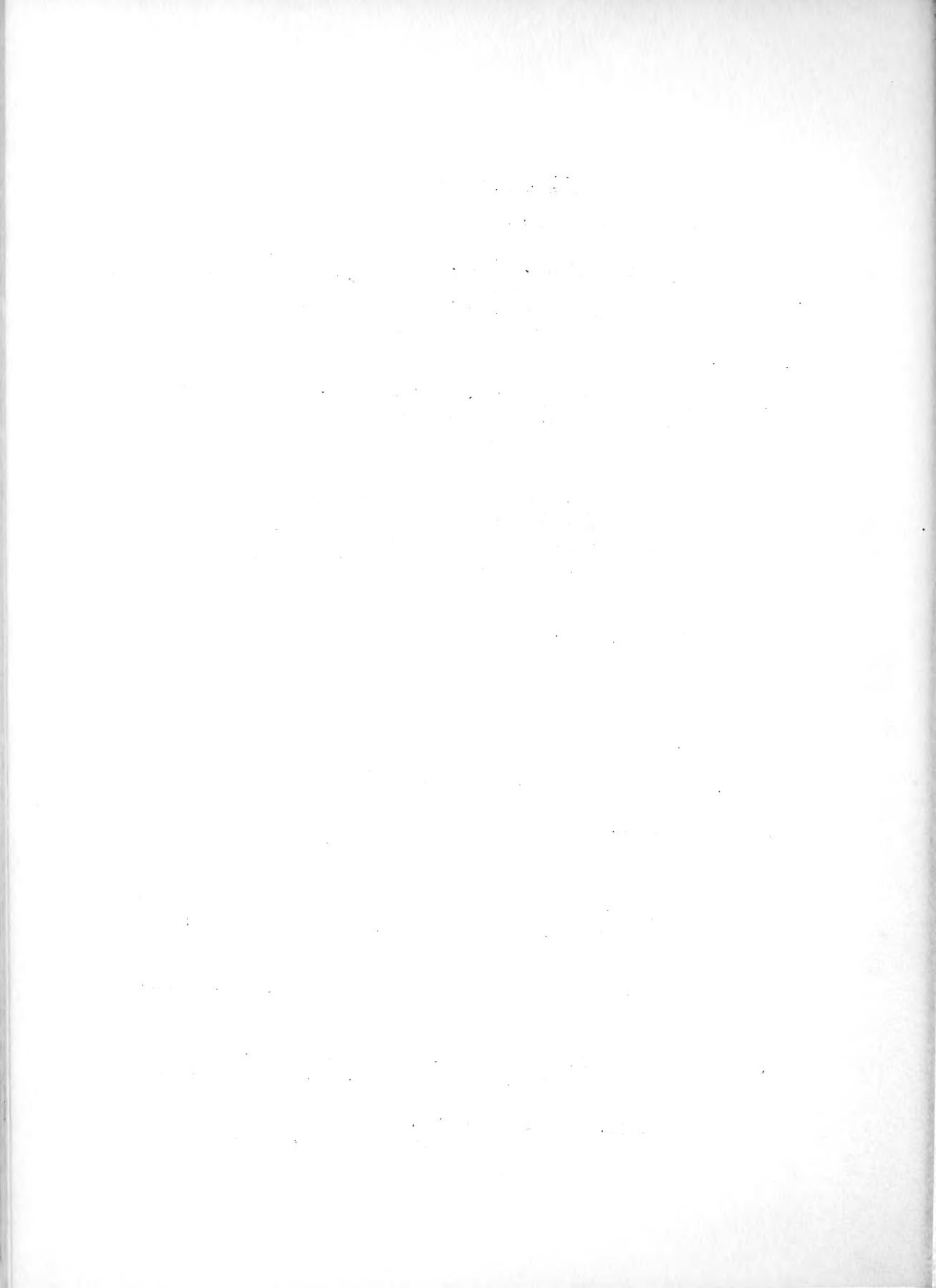


Historic, archived document

Do not assume content reflects current scientific knowledge, policies, or practices.



THE
PLANT DISEASE REPORTER
ISSUED BY
THE OFFICE OF MYCOLOGY AND DISEASE SURVEY

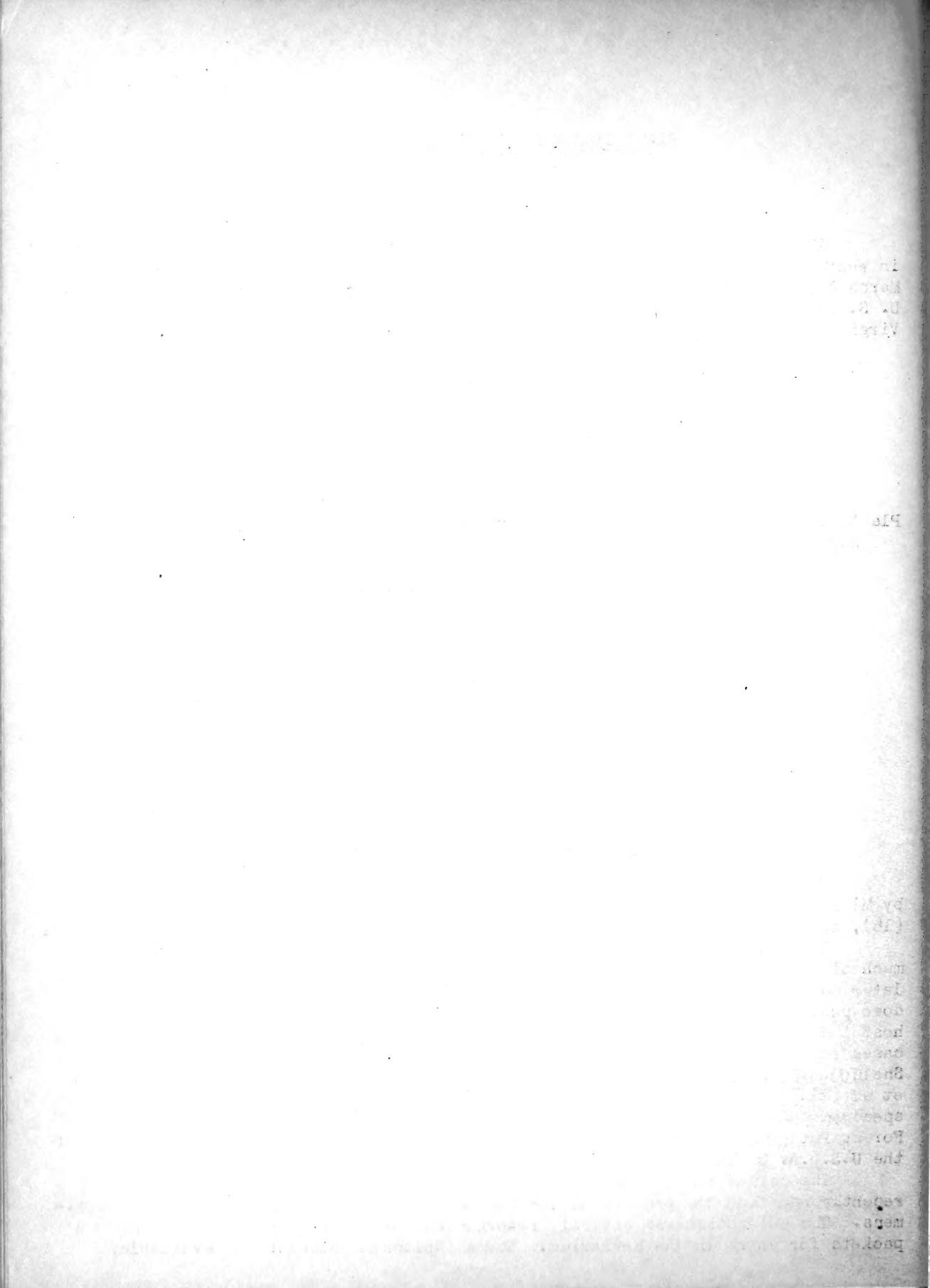
Supplement 72

Plant Diseases in West Virginia in 1923

December 30, 1929



BUREAU OF
PLANT INDUSTRY
UNITED STATES DEPARTMENT OF AGRICULTURE



PLANT DISEASES IN WEST VIRGINIA IN 1928

With 4 plates, 5 figures and 8 tables.

This report is the result of a survey of the diseases of plants occurring in West Virginia in 1928. During the period of the survey, March 15, 1928 to March 15, 1929, the writer was employed jointly by the Bureau of Plant Industry, U. S. Department of Agriculture, and the Department of Plant Pathology of West Virginia Agricultural Experiment Station.

By

W. A. Archer, Assistant Pathologist,
Office of Mycology and Disease Survey,
Bureau of Plant Industry.

Plant Disease Reporter
Supplement 72

December 30, 1929

TABLE OF CONTENTS

Introduction	324
Diseases of pome fruits	325
Diseases of stone fruits	329
Diseases of small fruits	331
Diseases of cereals	332
Diseases of forage and field crops	337
Diseases of vegetables	340
Diseases of ornamentals	348
Diseases of non-cultivated plants	353

INTRODUCTION

The principal records of West Virginia fungi and diseases have been made by Millspaugh (15), Giddings (9), Giddings and Berg (10), Millspaugh and Nuttall (16), Sheldon, Clara F. (21), Sheldon, J. L. (22, 23) and Sherwood and Peairs (25).

The two lists, Millspaugh (1.c.) and Millspaugh and Nuttall (1.c.) contain much of the data of the earlier collections made by Nuttall and by Sheldon. The later collections of Nuttall are unpublished but the West Virginia University does possess a check list made by Mr. Nuttall. This consists of a copy of the host index by Farlow and Seymour (7) in which was entered check marks and in many cases interpolated sheets of new additions for the state. Likewise specimens of Sheldon are unrecorded except indirectly by Clinton (6), Arthur (3) and Anderson et al (2). Incidentally, various people have contributed numbers of West Virginia specimens of wood-destroying fungi to the herbarium of the U.S.D.A. Office of Forest Pathology and likewise to the Lloyd collections now under the direction of the U.S.D.A. Office of Mycology and Disease Survey.

The collections of Nuttall were given to the University of West Virginia recently and thus the present author had the opportunity of studying these specimens. The collection was entirely re-organized and finally changed into new packets for entry in the herbarium. Where duplicate material was available,

extra packets were made for the mycological collections of the U. S. Department of Agriculture. Also, a number of specimens from duplicate material was sent to the mycological herbarium at the University of Michigan. In this manner, this extremely valuable collection has been made available for future study at these different places. The collection of Sheldon, especially rich in parasitic and unusual fungi, is not at present available for study but is stored in the home of Dr. Sheldon at Morgantown.

The author, during the season of 1928, traveled extensively through the state making observations and collecting specimens of diseases of economic crops. In addition, considerable attention was given to collecting various parasitic fungi. In this manner, a total of 2,000 specimens was obtained for study.

This report can be considered as an attempt to summarize briefly the data on plant diseases in the state for 1928, but to a slight extent information for the past years has been given. The chief source of earlier information has been the West Virginia file of annual reports of the Plant Disease Survey Collaborator. These reports are by no means complete for various crops in consecutive years and in many cases the data are scanty for individual years.

Out of the 437 plant diseases in this list, 227 are new to the state or, at least, they represent the first report for the state to the Plant Disease Survey. These new reports are marked in the list by an asterisk. The numbers which appear in parentheses after the fungous name refer to the author's collection number of the specimen.

The writer is indebted to Dr. N. J. Giddings of the Department of Plant Pathology of West Virginia University for assistance in making this survey possible. Appreciation is expressed to Dr. P. D. Strasbaugh, Botany Department of the University of West Virginia, for his identification of host plants; to Mr. E. C. Sherwood for disease survey data relating particularly to apples and potatoes; to Mr. E. E. Berkeley for identification of grasses; and to Mr. R. W. Davidson for identification of the rusts. Obligations are due to Mr. Gibbs (cfr. 8) for the use of certain of his illustrations now comprised in text figures 12 to 16 of this publication.

DISEASES OF POME FRUITS

APPLE

ARMILLARIA MELLEA (Vahl.) Quel. (root rot). Occasionally losses have been reported from this source, especially in young trees planted in newly cleared land. The disease was not observed in 1928.

BACILLUS AMYLOVORUS (Burr.) Trev. (fire blight). Estimated loss 3 per cent. Blossom and twig blight were severe over the entire state. Jonathan was especially susceptible although varieties like York, Grimes and Ben Davis were rather severely affected locally. The wild crab and the English Haw also were severely affected.

CYLINDROSPORIUM POMI Brooks (fruit spot). Loss 1 per cent. Losses from this source have never been more than a trace except in 1923 when it was considered to be 2 per cent. In 1928 infection occurred late and caused considerable damage in storage.

VALUE OF CROPS RAISED ON W. VA. FARMS

\$74,969,600 AV 1923-27

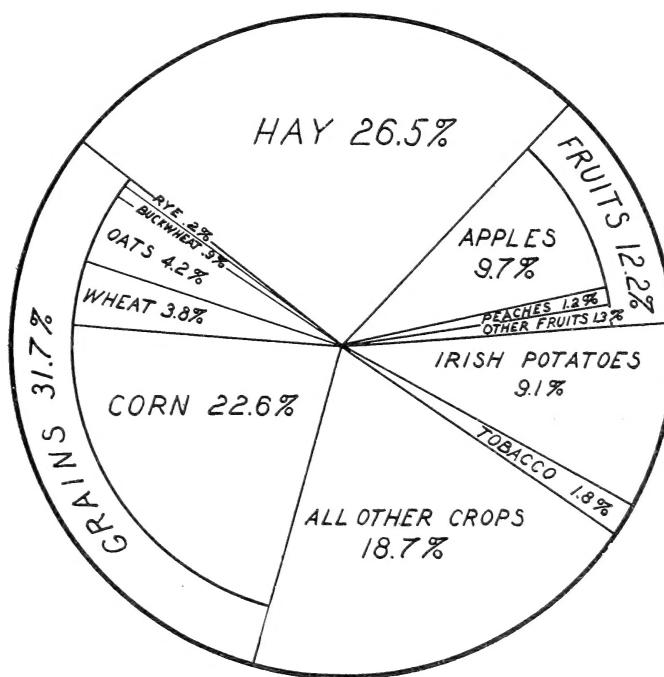


Fig. 12. Production statistics for West Virginia crops. (After Gibbs, 8)

extra packets were made for the mycological collections of the U. S. Department of Agriculture. Also, a number of specimens from duplicate material was sent to the mycological herbarium at the University of Michigan. In this manner, this extremely valuable collection has been made available for future study at these different places. The collection of Sheldon, especially rich in parasitic and unusual fungi, is not at present available for study but is stored in the home of Dr. Sheldon at Morgantown.

The author, during the season of 1928, traveled extensively through the state making observations and collecting specimens of diseases of economic crops. In addition, considerable attention was given to collecting various parasitic fungi. In this manner, a total of 2,000 specimens was obtained for study.

This report can be considered as an attempt to summarize briefly the data on plant diseases in the state for 1928, but to a slight extent information for the past years has been given. The chief source of earlier information has been the West Virginia file of annual reports of the Plant Disease Survey Collaborator. These reports are by no means complete for various crops in consecutive years and in many cases the data are scanty for individual years.

Out of the 437 plant diseases in this list, 227 are new to the state or, at least, they represent the first report for the state to the Plant Disease Survey. These new reports are marked in the list by an asterisk. The numbers which appear in parentheses after the fungous name refer to the author's collection number of the specimen.

The writer is indebted to Dr. N. J. Giddings of the Department of Plant Pathology of West Virginia University for assistance in making this survey possible. Appreciation is expressed to Dr. P. D. Strasbaugh, Botany Department of the University of West Virginia, for his identification of host plants; to Mr. E. C. Sherwood for disease survey data relating particularly to apples and potatoes; to Mr. E. E. Berkeley for identification of grasses; and to Mr. R. W. Davidson for identification of the rusts. Obligations are due to Mr. Gibbs (cfr. 8) for the use of certain of his illustrations now comprised in text figures 12 to 16 of this publication.

DISEASES OF POME FRUITS

APPLE

ARMILLARIA MELLEA (Vahl.) Quel. (root rot). Occasionally losses have been reported from this source, especially in young trees planted in newly cleared land. The disease was not observed in 1928.

BACILLUS AMYLOVORUS (Burr.) Trev. (fire blight). Estimated loss 3 per cent. Blossom and twig blight were severe over the entire state. Jonathan was especially susceptible although varieties like York, Grimes and Ben Davis were rather severely affected locally. The wild crab and the English Haw also were severely affected.

CYLINDROSPORIUM POMI Brooks (fruit spot). Loss 1 per cent. Losses from this source have never been more than a trace except in 1923 when it was considered to be 2 per cent. In 1928 infection occurred late and caused considerable damage in storage.

VALUE OF CROPS RAISED ON W. VA. FARMS

\$74,969,600 AV 1923-27

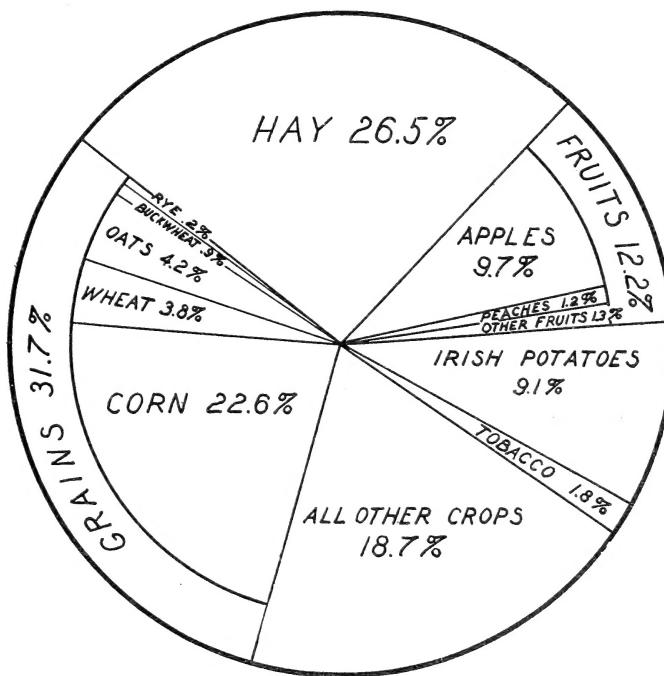


Fig. 12. Production statistics for West Virginia crops. (After Gibbs, 8)

GLOEODES POMIGENA (Schw.) Colby (sooty blotch). Unusually severe this year, especially in home orchards. In commercial areas it was adequately controlled by the regular spray schedule, but where the late spray applications were omitted considerable damage occurred in low-lying orchards.

GLOMERELLA CINGULATA (Ston.) Sp. & Sc. (bitter rot). Loss a trace. This disease was limited locally to a few orchards in the state. It has never had the status of an important trouble since it seems usually to occur only slightly in localized areas. In a rare year it has been severe in restricted areas on a few susceptible varieties, such as King David.

GYMNOSPORANGIUM JUNIPERI-VIRGINIANAE Schw. (rust). Loss a trace. The first infection of the season was observed June 20, occurring as a few pycnia in Hampshire County. In comparison with the average situation the disease throughout the season of 1928 was constantly unimportant no doubt as a direct result of unfavorable weather conditions. Some damage occurred in southern orchards. Cedar eradication during the past ten years has done much to eliminate the trouble from commercial orchards.

ILLOSPORIUM MALIFOLIORUM Sheldon. (leaf spot) (3261, 3270). Loss a trace. While the well known frog-eye leaf spot occurs in West Virginia quite abundantly, there is another leaf spot described by Sheldon (24) and said to be caused by Illosporium malifoliorum. The two types of spots are distinct although they may at times occur together on the same leaf. The common frog-eye disease is supposedly caused by the initial injury of Sphaeropsis followed by secondary organisms, such as Phyllosticta, Coniothyrium, Alternaria, etc. This spot is characterized by more or less definitely circumscribed, concentric, brownish spots of about 3 mm. diameter. The leaf spot described by Sheldon is grayish, irregular in shape, with a scalloped margin, 5-20 mm. diameter often involving the major portion of the leaf. (See Pl. II). The sporodochia of the Illosporium malifoliorum are found abundantly on the under surface of such leaves. The appearance of the frog-eye spot in West Virginia is well depicted by Scott and Rorer (20, Pl. 3, fig. 1). The Illosporium spot is well represented by Roberts (18, Pl. 7, fig. 1). The frog-eye spot is widespread in the state and is responsible for considerable defoliation. The Illosporium spot is most abundant in the southern part of the state, where it ordinarily brings about severe defoliation. (See Pl. III, A).

LEPTOTHYRIUM POMI (M. & F.) Sacc. (fly speck). Loss 2 per cent. Fly speck was unusually severe, especially in home orchards. In commercial areas the regular spray schedule controlled it adequately, but where the late spray applications were omitted considerable damage occurred in low-lying orchards.

NUMMULARIA DISCRETA (Schw.) Tul. (blister canker). Loss a trace. As usual this disease attracted attention only as an occasional dead branch in old neglected Ben Davis orchards.

*PHYLLOSTICTA PRUNICOLA (Opiz.) Sacc. (leaf spot) (4041, 4095, 4096, 4109). This organism was common late in the season on both sprayed and unsprayed trees. The exact nature of the fungus as a pathogen has not been fully determined but it is suspected to be the cause of considerable defoliation that occurred in 1928. The fungus was also found on pear, on Prunus americana, on Prunus serotina, and on Pyrus coronaria.

PHYLLOSTICTA SOLITARIA E. & E. (blotch). Loss a trace. Blotch was severe this year only in southern, neglected orchards. In the commercial areas, i.e. in the Eastern Panhandle of the state, it was controlled perfectly by spray. Northwestern Greening, Smith Cider, Duchess, Stark, and Winter Banana are considered to be most susceptible; Rome Beauty and Ben Davis only moderately so.

PHYSALOSPORA MALORUM (Pk.) Shear (black rot, frog-eye). Not of much economic importance in 1923. (See also under Illosporium).

PODOSPHAERA OXYACANTHAE (DC.) D By. (powdery mildew). Loss a trace. In certain localities this year the disease was more severe than usual, on some varieties. In the past it has been important mostly on young, unsprayed trees. Jonathan, Gano and Stayman Winesap seem to be the susceptible varieties.

SCLEROTINIA FRUCTICOLA (Wint.) Rehm. (brown rot). Once or twice in the past this disease has been reported to be slight. Ordinarily, however, it is not seen.

VENTURIA INEQUALIS (Cke.) Aderh. (scab). Loss 1 per cent. In the earlier part of the season scab was fairly abundant on the leaves and seemed to point toward severe damage. At the end of the year, however, the damage was not as severe as had been expected. The commercial crop showed a low percentage of damaged apples and even in some neglected orchards much of the fruit was clean. The wild crab, Pyrus coronaria, was moderately infected.

VOLUTELLA FRUCTI Stevens (dry rot). In a few years this rot has occurred to a slight extent on Northwestern Greening but it was not seen in 1928.

XYLARIA spp. (root rot). This disease seems to be limited in occurrence to the Eastern Panhandle. A few definite examples are found from year to year.

BITTER PIT (undet.). In the past bitter pit has caused losses in York Imperial varying from a trace to 4 per cent. This year the disease was absent.

BURR KNOT (undet., possibly aerial crown gall). In the past this branch gall has attracted considerable attention because of its unusual prevalence in localized areas. It is encountered in sparse examples on certain varieties one year or another, throughout the state.

FLAP TUMOR (undet.) (2067). Near Morgantown an example was observed of this peculiar malformation. All the branches of a single tree were involved. It has been observed once or twice in past years. Unquestionably this is the disease described by Reed and Crabill (17, p. 42-43, fig. 4-5).

JONATHAN SPOT (undet.). The occurrence of this disease has always been scattered and slight. It was not observed in 1923.

MEASLES (undet.) (2063). Occurs in scattered counties throughout the state and appears to be of increasing importance. It was noted to be severe on a few trees in various localities this year. The trees were marked by stunted growth and sparse foliage.

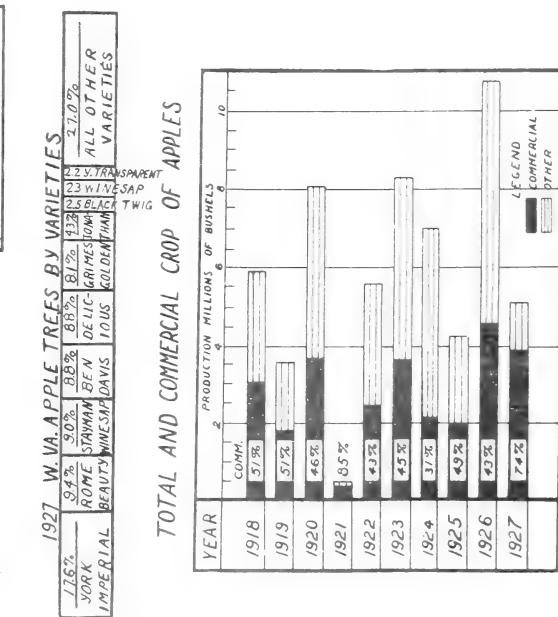
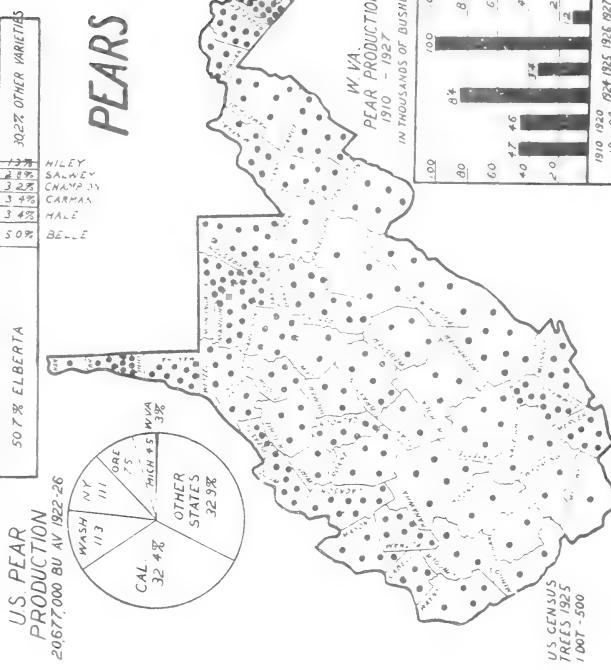
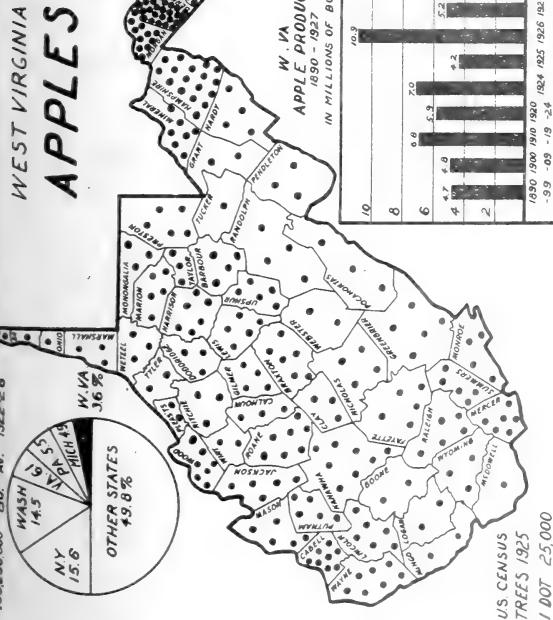
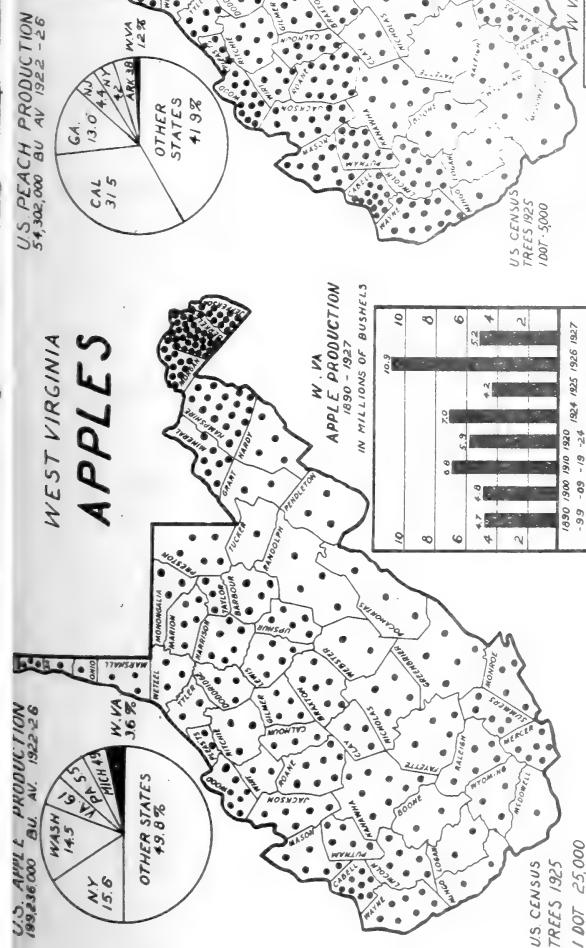


Fig. 13. Production statistics for apples, peaches and pears.
(After Gibbs, 1918)



TARGET CANKER (Undet.) (4125). In the southern part of the state there occurs moderately a type of injury which seems to be the target canker described recently by Roberts (18).

Table 80. Estimated percentage losses from apple diseases in 1928.

Disease	Percentage loss	Disease	Percentage loss
Bitter rot	Trace	Scab	1
Black rot	Trace	Fly speck	2
Blotch	Trace	Fruit spot	1
Cedar rust	Trace	Other diseases	Trace
Fire blight	5	All diseases (total)	7

PEAR

BACILLUS AMYLOVORUS (Burr.) Trev. (blight). Loss 10 per cent. The severity this year fully equals that of last year.

FABRAEA MACULATA (Lev.) Atk. (leaf blight) (4050). Loss 4 per cent. On unsprayed trees this leaf spot caused severe defoliation and also in many localities the fruit was badly spotted. (See Pl. III, B).

*GLOEODES POMIGENA (Schw.) Colby (sooty blotch). The loss is estimated as a trace. In one locality a yellow, early variety was severely blotched.

MYCOSPHARRELLA SENTINA (Fr.) Schroet. (leaf spot) (4097). In various localities this leaf spot appeared in a severe form, although defoliation was only slight or moderate.

*PHYLLOSTICTA PRUNICOLA (Opiz.) Sacc. (leaf spot) (4098). See under apple.

VENTURIJA PYRINA Aderh. (scab). Severe cases have been observed occasionally but in 1928 the disease did not appear. Losses have never been more than 1 per cent.

*BROWN BLOTH (undet.) This disease is reported for the first time in the state, although undoubtedly it has been present previously. Many varieties were severely attacked but seemingly the market value of the fruit was not damaged. In fact the blotched appearance is generally considered to be the natural condition of the fruit.

Table 81. Estimated percentage losses from pear diseases in 1928.

Disease	Percentage loss	Disease	Percentage loss
Fire blight	10	Other diseases	Trace
Scab	0	All diseases (total)	14
Leaf blight	4		

QUINCE

BACILLUS AMYLOVORUS (Burr.) Trev. (blight). The quince suffered severely from twig blight throughout the state. The loss was about 10 per cent.

FABRAEA MACULATA (Lev.) Atk. (leaf blight) (4063, 4064). Loss a trace. As usual this leaf spot was severe. It caused heavy defoliation and moderate spotting of the fruit.

GLOMERELLA CINGULATA (Ston.) Sp. & Sc. (bitter rot) (4121). Severely infected trees were noted in several localities in the Eastern Panhandle.

GYMNOSPORANGIUM GERMINALE (Schw.) Kern (rust). In 1924 an unusually severe occurrence was reported on quince fruits. The loss was estimated at 3 per cent. Ordinarily the rust is slight or absent as in 1928.

PHYSALOSPORA MALORUM (Pk.) Shear (black rot) (4094). Probably 2 per cent loss. Fruit rot was severe and general.

*PODOSPHAGRA OXYACANTHAE (DC.) D By. (Powdery mildew) (4065). It occurred abundantly especially on lower leaves.

DISEASES OF STONE FRUITS

PEACH

BACTERIUM PRUNI EFS. (bacterial spot). This disease is probably common but only a few reports of occurrence are on file and it was not definitely observed in 1928.

CLADOSPORIUM CARPOPHILUM Thuem. (scab). Loss 1 per cent. Unsprayed fruit was severely attacked, in fact considerably more than usual. Leaves were affected scantily. The disease was controlled perfectly in commercial orchards.

EXOASCUS DEFORMANS (Berk.) Fuck. (leaf curl). Severe infection resulting in considerable damage to the trees has occurred in previous years. In 1928, however, the disease was not seen except on some unsprayed trees.

PODOSPHAERA OXYACANTHAE (DC.) D By. (powdery mildew). Slight traces have been reported before 1915, but apparently in more recent years the disease has not occurred.

SCLEROTINIA FRUCTICOLA (Wint.) Rehm. (brown rot). The loss is considered to be a trace. Losses as high as 10 and 5 per cent were reported before 1924 but in more recent years they have been estimated as a trace to 1 per cent. In 1928 only scattered examples were observed.

YELLOWS (undet.) In 1922, this disease was reported to occur generally with a loss estimated at 2 per cent. The disease has not been of any great importance since that time but is to be found locally throughout the state.

Table 82. Estimated percentage losses from peach diseases in 1928.

Disease	Percentage loss	Disease	Percentage loss
Leaf curl	Trace	Scab	1
Brown rot	1	Other diseases	0
Yellows and little peach	0	All diseases (total)	2

PLUM

EXOASCUS PRUNI (Berk.) Fuck. (plum pockets). Slight traces of this disease are known to appear in isolated areas. The disease was not seen this year.

PLOWRIGHTIA MORBOSA (Schw.) Sacc. (black knot). This is the most important disease of the plum, excepting brown rot. Losses as high as 5 per cent have been reported. In 1928 the disease did not attract particular attention.

SCLEROTINIA FRUCTICOLA (Wint.) Rehm. (brown rot). Ordinarily losses from this source are estimated between 3 to 5 per cent. In 1928, however, the disease was not significant, the loss being a trace.

CHERRY

COCCOMYCES HEMALIS Higg. (leaf spot) (4110). Loss a trace. During mid autumn defoliation was severe. This was true also of the wild cherries, Prunus serotina and P. pennsylvanica.

PLOWRIGHTIA MORBOSA (Schw.) Sacc. (black knot). This disease has been reported as severe a few times in the past. This year it was not reported or observed except on the wild hosts.

SCLEROTINIA FRUCTICOLA (Wint.) Rehm. (brown rot). This disease has been the cause of considerable damage in some years. It was not noted in 1928.

DISEASES OF SMALL FRUITS

RASPBERRY

BACTERIUM TUMEFACIENS EFS. & Towns. (crown gall). Crown gall has been reported in amounts ranging from a trace to 1 per cent before 1925. The disease has not been definitely reported since that time but a few cases have been observed each year.

GYMNOCONIA INTERSTITIALIS (Schl.) Lagh. (orange rust). Moderate amounts have occurred in some years but in the present season none was observed.

LEPTOSPHAERIA CONIOTHYRUM (Fuck.) Sacc. (cane blight). Formerly this was considered to be the most important disease of raspberries in the state but more recently its importance has not been evident. It was not observed this season.

MYCOSPHAERELLA RUBI Roark. (leaf spot) (2080). Moderate importance.

PLECTODISCELLA VINETA (Speg.) Burk. (anthracnose). Loss 2 per cent. This is an important disease of the raspberry but the losses are erratic, varying from a trace to 4 per cent. The loss in 1928 probably lies close to 2 per cent. Canes were observed severely attacked in a number of localities.

*MOSAIC (virus). A slight amount was observed in a few plants in a planting of black raspberries.

BLACKBERRY

GYMNOCONIA INTERSTITIALIS (Schl.) Lagh. (orange rust). In a few years of the past the orange rust has been reported as rather severe although it has not caused noticeable damage. In 1928 it was conspicuously absent.

PLECTODISCELLA VINETA (Speg.) Burk. (anthracnose). The disease has been reported in past years but apparently it has slight importance in the state. It was not observed in 1928.

CURRENT

BOTRYOSPHAERIA RIBIS Gross. & Dug. (cane blight). This disease is the most severe one of currant, but exact information on distribution and loss is not available.

CERCOSPORA ANGULATA Wint. (leaf spot) (3069). Practically complete defoliation of red currants was observed in a number of cases.

GRAPE

GUIGNARDIA BIDWELLII (Ell.) V. & R. (black rot). This year the loss was about 10 per cent. This disease was an important factor for the first time since 1924. In some southern sections fully half of the crop was rotted. In past years losses of 10 to 25 per cent have been common.

PLASMOPARA VITICOLA (B. & C.) B. & D. T. (downy mildew). This disease was abundant this year for the first time in four years. Infection occurred rather late in the season. The disease is not economically important in the state because infection is too scanty or else occurs too late in the season to cause much injury.

UNCINULA NECATOR (Schw.) Bur. (powdery mildew). Not important.

STRAWBERRY

DENDROPHOMA OBSCURANS (E. & E.) Ander. (leaf spot) (3301, 4117). This leaf spot was seen in various localities in slight to moderate amounts. The damage was slight in all cases.

MYCOSPHAERELLA FRAGARIAE (Tul.) Lind. (leaf spot). This leaf spot was generally distributed as usual but apparently less severe this year. The damage was negligible.

DISEASES OF CEREALS

BARLEY

*HEIMINTHOSPORIUM GRAMINEUM Rabh. (stripe) (2046). Loss about a trace. In general barley was remarkably free from disease; although in scattered eastern fields severe cases were observed.

USTILAGO HORDEI (Pers.) Kell. & Sw. and U. NUDA (Jens.) Kell. & Sw. (covered and loose smut) (2045). Loss a trace. In the early crop, harvested for grain, smut was extremely slight; most fields showing only a trace and only a few with as much as 0.5 per cent. However, in the late crop, planted for forage, as high as 30 per cent was sometimes found.

CORN

DIPLODIA ZEAE Lev., GIBBERELLA, and FUSARIUM SP. (ear rot). Loss 2 per cent. Corn, though widely planted, is a neglected crop from the standpoint of modern farm practice. Corn remains in the shock and is harvested during the winter. Seed selection is not practiced generally.

FUSARIUM MONILIFORME Sheld. and GIBBERELLA SAUBINETII (Mont.) Sacc. (root rot). Loss 10 per cent. Observations throughout the year lead to the conclusion that root rot is constantly associated with unfavorable crop conditions, i.e., root worm injury, poor soil, insufficient drainage, etc. During the early season in the Eastern Panhandle, fully half of the plants showed signs of disease in nearly all fields when the seedlings were about six inches high. Elsewhere in the state the infection ranged mostly between 1 to 5 per cent. Later in the season, during August, continued rains kept low ground and bottom land continually flooded so that fully 25 per cent of the crop was yellowed and dwarfed. During late season in the Eastern Panhandle most of the diseased plants apparently had outgrown their seedling infection because only a small percentage showed evident signs of disease. Isolations from diseased plants throughout the year yielded commonly Fusarium moniliforme or Gibberella saubinetii and less frequently F. culmorum.

HEMIMENOSPORIUM TURCICUM Pass. (leaf blight) (3273). Loss 3 per cent. This has been one of the most severe diseases of corn this year. It was widely distributed over the state and in southern portions it resulted in general premature ripening of the crop. In the more severe cases the fungus killed all the leaves of the plants at least a full month before the usual ripening period.

PUCCINIA SORGHII Schw. (rust). Rust was not observed until September. It was extremely slight and ordinarily only a few scattered plants were affected.

USTILAGO ZEAE (Beckm.) Ung. (smut) (2086). Loss 0.5 per cent. Careful counts made throughout the state indicated only a slight loss from smut. Ten per cent was the highest percentage of infection observed in any one field. Ear infection was computed to be considerably less than 1 per cent for the state. Early in the season the unusual occurrence of a smut boil on the root of a six inch seedling was noted.

*TRANSLUCENT SPOT (undet.) (3269, 4036). This leaf spot was generally distributed and rather common in most fields. In fact, at least 2 per cent of the plants were affected in some southern localities. Miss Florence Hedges of the U.S.D.A. Pathological Laboratory, who examined West Virginia collections, reports that despite the striking resemblance to bacterial lesions no bacteria were found. It seems that this is the non-parasitic leaf spot which has been reported to the Plant Disease Survey office from several other states.

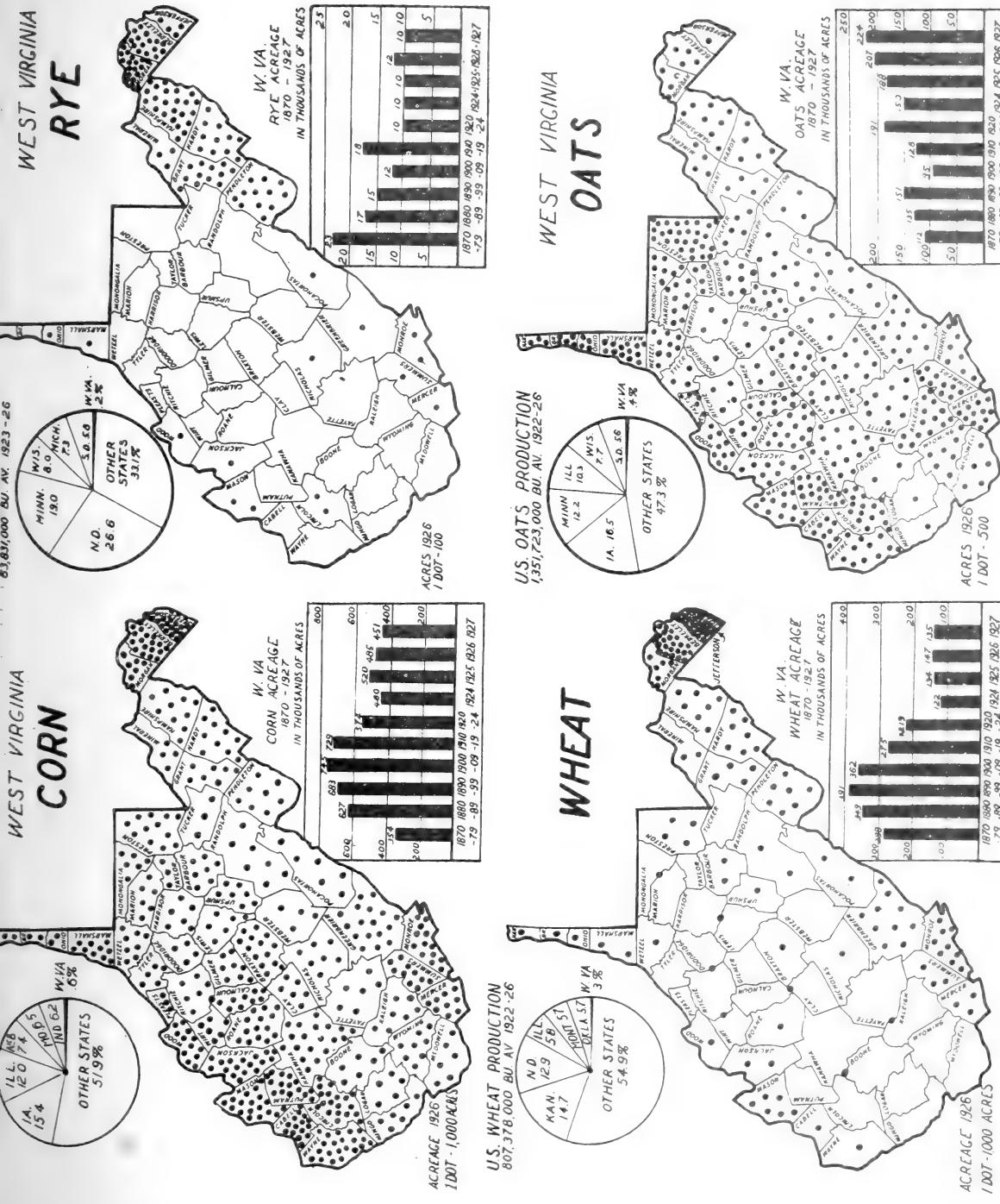


Fig. 14. Production statistics for corn, rye, wheat and oats.
(After Gibbs, 8)



Table 83. Estimated percentage losses from corn diseases in 1928.

Disease	Percentage loss	Disease	Percentage loss
Smut	0.5	Leaf blight	3
Leaf rust	0	Other diseases	0
Root rot (Gibberella, Fusarium)	10	All diseases (total)	13.5
Ear rots (Fusarium, Diplodia)	2		

BROOM CORN

*COLLETOTRICHUM LINHOLIA Cda. (anthracnose) (4113). All fields were affected at least slightly although a few were moderately attacked.

SWEET CORN

APLANOBACTER STEWARTII (EFS.) McC. (bacterial wilt). Only a few scattered examples were noted.

*EPICOCCUM NEGLECTUM Desm. and PHOMA ZEICOLA E. & E. (leaf blight) (3049, 4032, 4062). On diseased sweet corn leaves these two organisms occurred rather constantly associated. In one case most of the plants in a garden plot were severely affected but in this instance the affected leaves in their early stages resembled a condition of genetical mosaic. Such leaves were marked by distinct, yellowed and parallel stripes. In the latter condition these yellowed areas were dry and dead and bore profuse fruitings of the two fungi.

*HELMINTHOSPORIUM TURCICUM Pass. (leaf blight) (4086). Slight or moderate in only a few fields.

OATS

HELMINTHOSPORIUM AVENAE Eidam (leaf spot) (3009, 3044). The occurrence of this disease was widespread. By July, practically all fields had lost all the leaves on the lower half of the plants, while the upper leaves showed a plentiful infection. In some fields seedling blight occurred in low, moist ground. By harvest time the disease had progressed to a stage that probably reduced the yield by at least 5 per cent.

PUCCINIA CORONATA Cda. (crown rust). In an average year, crown rust has been rather abundant but usually the losses have never been considered to be more than a trace. In 1928, late in the season, it appeared moderately in the experimental plots at Morgantown but none was observed in commercial fields over the state.

USTILAGO AVENAE (Pers.) Jens. and U. LEVIS (K. & S.) Magn. (loose and covered smuts). The loss for the state was about 5 per cent. In southern localities and in the Eastern Panhandle, fields were found frequently with as high as 20 to 30 per cent of the plants affected.

Table 84. Estimated percentage losses from oat diseases in 1928.

Disease	Percentage loss	Disease	Percentage loss
Loose and covered smuts	5	Leaf spot	5
Stem rust	0	Other diseases	0
Leaf rust	0	All diseases (total)	10

RYE

CLAVICEPS PURPUREA (Fr.) Tul. (ergot). Not observed since 1925.

ERYSIPHE GRAMinis DC. (powdery mildew) (2000). In the experimental plots of the agronomy farm at Morgantown all lower leaves were severely attacked and mostly killed, but elsewhere in the state the mildew occurred not at all or only rarely to a slight extent.

*HELMINTHOSPORIUM (?) TRITICI-REPENTIS Died. (leaf blight) (2021). In one field all leaves were killed or heavily infected. The cause of the trouble seemed due principally to the Helminthosporium although the sori of Puccinia dispersa Eriks. were plentiful. The organism was examined by Charles Drechsler who reported: "As the spores are dead and thus somewhat collapsed, accurate determination is difficult. Certainly not H. sativum nor any of the Ophiobolus series. Very evidently a member of the Pyrenophaera series; and shape and size of basal cell suggests H. tritici-repentis."

PUCCINIA DISPERSA Eriks. (leaf rust). Loss a trace. A few severe examples were seen but most fields were extremely free from disease.

PUCCINIA GRAMinis Pers. (stem rust). Not observed this year. In some years a slight attack occurs.

UROCYSTIS OCCULTA (Wallr.) Rabh. (stem smut) (2033). Observations this year were limited to a few infected plants in a single field in Berkeley County in the Eastern Panhandle. Past observations have recorded the same slight occurrence every year in this one county. Only rarely has it been found elsewhere.

WHEAT

CLAVICEPS PURPUREA (Fr.) Tul. (ergot). Ergot has been reported in an occasional year but it was not seen this year.

ERYSIPHE GRAMINIS DC. (Powdery mildew) (2001). In the agronomy experimental plots at Morgantown during June all plants were severely attacked, with younger shoots entirely killed. Elsewhere in the state, however, the disease was observed as usual only rarely and then merely as a trace.

GIBBERELLA SAUBINETII (Mont.) Sacc. (scab). The crop ripened this year with only scattered traces of scab. Evidently it has been slightly important in late years. Previous to 1920 high losses were reported.

MYCOSPHAERELLA TULASNEI Jacz. (sooty mold) (2049). In several instances in the Eastern Panhandle there were indications of considerable infection but even then the damage was slight. In general the disease was not encountered throughout the state.

PUCCINIA GRAMINIS Pers. (stem rust). The rust appeared first in extreme southern counties during early July and at this time the initial infection centers were plainly evident in practically all fields. The damage was negligible because the crop was nearly ready for harvest when the infection occurred. The rust was not seen elsewhere in the state.

PUCCINIA TRITICINA Eriks. (leaf rust). Loss a trace in 1928. Until about the first of July, only scattered traces of the rust occurred in the majority of the fields but during the short intervening period before ripening of the crop it had developed moderately in many fields. The damage to the grain was undoubtedly negligible in general because there were only a few isolated cases of severe attack. This has been practically the situation for the past 5 years. However, in the years 1918, 1919, 1921, 1922 losses were rather high, 18 per cent being reported in 1922.

SEPTORIA NODORUM Berk. (glume blotch) (3001, 3011, 3041). Loss 5 per cent. This disease occurred extensively over the state and in the majority of the fields all the heads were affected at least slightly. In some examples there was a 100 per cent infection. The attack became generally severe before harvest and it seems likely that glume blotch was responsible at least partly for the shriveled appearance of some of the threshed product, since no one other disease was prevalent this season. Despite the prevalence of the disease in previous years it has not been considered important.

TILIETIA LAEVIS Kuehn (bunt). In years previous to 1920, moderate losses were frequently reported but in more recent times losses have been considered to be only a trace. In 1928 the disease was not observed to occur.

TYLENCHUS TRITICI (Stein.) Bast. (nematode). In previous years traces of nematode have been reported from eastern counties bordering on Virginia. In 1928 no cases were observed.

USTILAGO TRITICI (Pers.) Rostr. (loose smut). Loss a trace. Loose smut was remarkably slight this year, the highest infection seen being only 2 per cent. Most fields showed only a trace. The scarcity of smut this year is thought to have been influenced by the slight seed infection of last year brought about by the dry early summer of 1927, during blossoming time. In other words, it is probable that the seed used for the 1928 crop was practically free from smut infection.

Table 85. Estimated percentage losses from wheat diseases in 1928.

Disease	Percentage loss	Disease	Percentage loss
Scab	0	Loose smut	Trace
Leaf rust	Trace	Glume blotch	5
Stem rust	0	Other diseases	0
Bunt	0	All diseases (total)	5+

DISEASES OF FORAGE AND FIELD CROPS

ALFALFA

*ASCOCHYTA IMPERFECTA Peck (leaf spot) (2021, 3042). Loss a trace. In many fields all lower leaves were affected.

*CERCOSPORA MEDICAGINIS E. & E. (leaf spot) (3148a). Scattered and slight.

MACROSPORIUM SP. (leaf spot) (3148). Slight occurrence in several fields. Associated with Paleospora hyalospora E. & E.

PSEUDOPHELVIA TRIFOLII (Lib.) Sacc. (leaf spot). The loss was about a trace. In most fields the damage was slight but in some cases the lower half of the plants was defoliated in the first crop.

PYRENOPEZIZA MEDICAGINIS Fuck. (yellow leaf spot) (3071). This spot was found in one field which had suffered severely from winter injury.

*WINTER INJURY (undet.) (2064). The loss for the state is about 60 per cent. All alfalfa fields in the mountainous parts of the state are severely affected by crown rot but fields in the Eastern Panhandle were practically free from the trouble. Alfalfa is comparatively a new crop to the state and consequently very little is known regarding suitable varieties. The soil type varies

considerably. Plants often "heave" out of the ground during the winter, thus becoming more subject to crown rot. This is particularly true of fields in a certain type of shale soil.

Near Parkersburg, a 2-year old field in shale soil was nearly dead but a short distance away a 3-year old plot on a black limestone ridge was in perfect condition.

CLOVER, HOP (*MEDICAGO LUPULINA*)

*CERCOSPORA MEDICAGINIS E. & E. (leaf spot) (3039). One field showed slight amounts.

CLOVER, RED

CERCOSPORA MEDICAGINIS E. & E. (leaf spot) (3151). Severe in one field.

COLLETOTRICHUM TRIFOLII Bain (anthracnose) (2027). Loss 20 per cent. This disease is generally distributed and causes severe damage to the crop. In many fields the second crop is a complete failure. The chief loss occurs when the plant crown is affected, thus bringing about the death of the plant. In the agronomy experimental plots, tests with several varieties would indicate the practical use of strains resistant to anthracnose.

ERYSIPHE POLYGONI DC. (powdery mildew). Though prevalent generally appreciable damage to the crop did not result.

MACROSPORIUM SARCINAEFORME Cav. (leaf spot) (3128, 3229, 4040). Loss a trace. Widespread with moderate to severe damage to leaves. Volunteer plants seemingly were more susceptible.

PSEUDOPEZIZA TRIFOLII (Biv.) Fuck. (leaf spot) (2062). In 1919 losses from this disease were estimated at 5 per cent. In other years, however, it has been slight or scattered resulting in negligible losses. In 1928 one field in Preston County was severely attacked.

UROMYCES FALIENS (Desm.) Kern (rust). Once or twice in the past this rust has been prevalent enough to cause slight damage but usually, as in 1928, it is absent.

*MOSAIC (virus) (3036). Occasionally a plant is found stunted and with mottled leaves.

CLOVER, WHITE SWEET (*MELILOTUS ALBA*)

*CERCOSPORA DAVISII E. & E. (leaf spot) (2034). Slight.

*MYCOSPHAERELLA LETHALIS Stone (stem spot) (4115). Severe and general causing a loss of a trace.

*PSEUDOPEZIZA MEDICAGINIS (Lib.) Sacc. (leaf spot) (4075). Moderate in one field. (See Jones, (13, p. 5 and 21).

CLOVER, WHITE (TRIFOLIUM REPENS)

*CERCOSPORA HELVEOLA Sacc. (leaf spot) (3230). A moderate amount was found in one locality.

PHYLLOLACHORA TRIFOLII (Pers.) Fuck. (sooty spot) (2050). Common.

*STAGONOSPORA CARPATHICA Baeuml. (leaf spot) (3005). Slight.

UROMYCES TRIFOLII (Hedw. f.) Lev. (rust) (3038). General distribution.

CLOVER, YELLOW SWEET (MELILOTUS INDICA)

*SEPTORIA MELILOTI (Lasch.) Sacc. (leaf spot) (2022). First report for the United States. Common in fields but not important.

SORGHUM

*CLADOSPORIUM SP. (marginal leaf spot) (3274). Infection slight.

COLLETOTRICHUM LINHOLA Cda. (anthracnose) (3272). Loss a trace. In many fields of southern counties all the leaves on the lower half of the plants were killed.

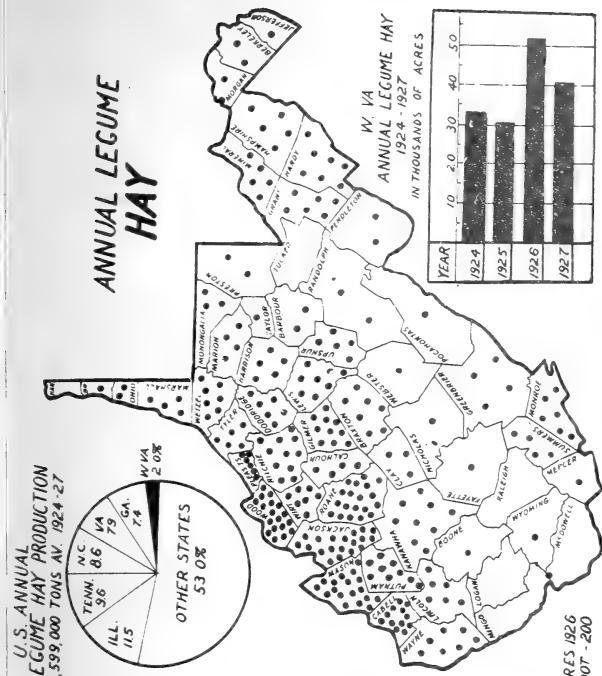
GRASS, BLUE

*SCOЛЕCOTRICHUM GRAMINIS Fuck. (leaf spot) (2010). Moderate in several fields in the Eastern Panhandle.

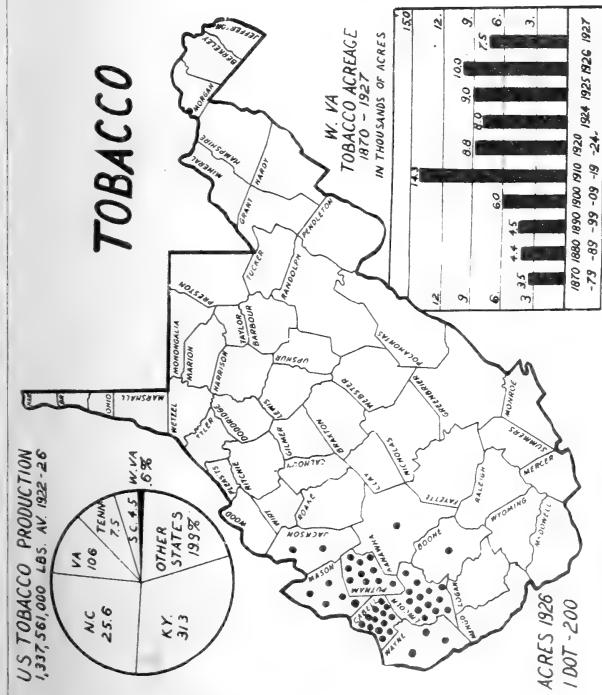
GRASS, TIMOTHY

PUCCINIA GRAMINIS Pers. (rust) (3340, 3107). Stem rust was common and especially severe on volunteer plants. A few cases were observed of parasitism on the rust by Fusarium parasiticum.

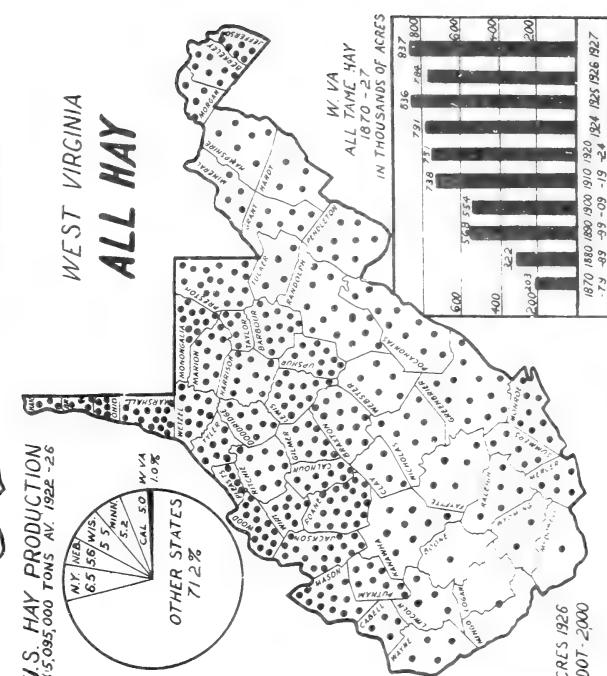
U.S. ANNUAL
LEGUME HAY PRODUCTION
3,589,000 TONS AV. 1922-27



U.S. TOBACCO PRODUCTION
1,337,561,000 LBS. AV. 1922-26



U.S. HAY PRODUCTION
15,035,000 TONS AV. 1922-26



U.S. BUCKWHEAT PRODUCTION
13,711,000 BUS. AV. 1922-26

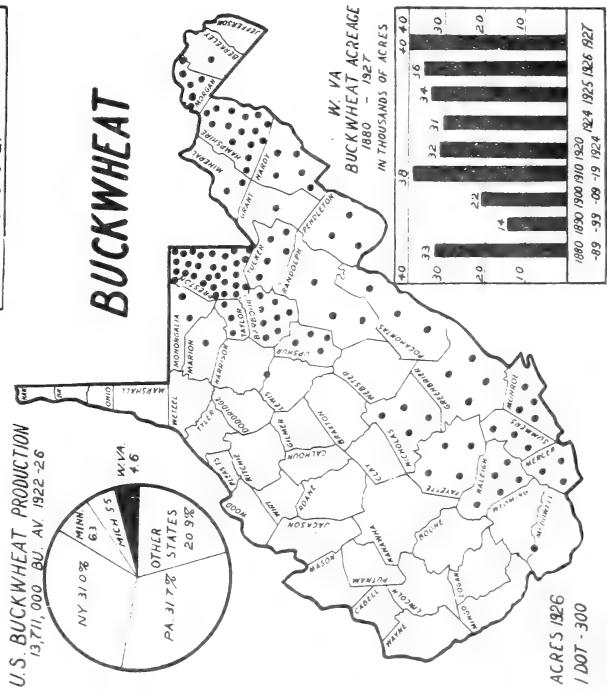


Fig. 15. Production statistics for tobacco, buckwheat and hay.
(After Gibbs, 8)



SOYBEAN

*BACTERIUM SP. (bacterial spot) (3004, 3007). This disease could be found in most of the fields but always was slight.

*PERONOSPORA MANSHURICA (Naoum.) Sydow (downy mildew) (3003, 3112). Usually the mildew occurs on small areas on the leaves and is well distributed over the field. The disease occurs throughout the state and in southeastern Ohio.

BUCKWHEAT

*PHYLLOSTICTA POLYGONORUM Sacc. (leaf spot) (3347, 3372). A fairly severe leaf infection evidently caused slight damage because it appeared late just before harvest.

TOBACCO

*CORTICIUM VAGUM B. & C. (soreshin). A few scattered plants were seen.

*THIELAVIA BASICOLA (black root rot). The majority of infected plants occurred in low portions of the fields. In the experimental plots at Point Pleasant the disease was extremely severe. For the entire tobacco district, however, the infection percentage was probably less than 1 per cent, causing a loss of about a trace. In the Plant Disease Reporter 12, p. 98, this disease was reported erroneously under the name of Fusarium oxysporum nicotianae.

*LEAF SPOT (probably physiological) (3281). Common, especially on lower leaves.

*MOSAIC (virus) (3093). Loss 2 per cent. Mosaic was distributed generally although some fields seemed to be comparatively free. The American Pride is evidently most susceptible; some fields showed at least 50 per cent. Usually the size of the infected plant seemed to be unaffected but the leaves were quite yellowed and crinkled.

*RING SPOT (virus). This disease occurred generally in the tobacco district on scattered plants.

DISEASES OF VEGETABLES

BEAN

BACTERIUM PHASEOLI EFS. (bacterial blight). Usually the bacterial blight occurs commonly in scattered areas. Losses in the past have varied between a trace to 1 per cent. The disease was not seen in 1928.

COLLETOTRICHUM LINDEMUTHIANUM (S. & M.) B. & C. (anthracnose). In an average year losses have been estimated at about 4 per cent, although in 1919, 20 per cent loss was reported. This year infection was slight and occurred late in the season.

FUSARIUM MARTII PHASEOLI Burk. (dry root rot). As usual this rot was scattered and slight.

ISARICPSIS GRISEOLA Sacc. (angular leaf spot) (4140). Only a few cases were observed in scattered localities.

PHYLLOSTICTA PHASEOLINA Sacc. (leaf spot) (3226, 3329). A few diseased leaves were found in various scattered localities.

SCLEROTINIA SCLEROTIORUM (Lib.) Mass. (stem rot). In the past this disease has been known to occur in the central portion of the state in the higher altitudes. Sometimes all the plants of a garden have been destroyed. Not observed in 1928.

UROMYCES APPENDICULATUS (P.) Iik. (rust). Appeared late and was slight. It occurred mostly on pole beans.

MOSAIC (virus) (3227). Slight and scattered as usual.

BEAN, LIMA

PHYTOPHTHORA PHASEOLI Thax. (downy mildew). There are reports of occurrence in 1920 and 1922 but the disease has not been observed since that time.

BEET

CERCOSPORE BETICOLA Sacc. (leaf spot). Loss from this source is estimated as a trace.

CABBAGE

ALTERNARIA BRASSICAE (B.) Sacc., (black leaf spot) (3262, 3373). In general confined to a few lower leaves.

BACTERIUM CAMPESTRE (Pam.) EFS. (black rot). Mostly in gardens.

FUSARIUM CONGLUTINANS Woll. (yellows). The loss for the state is probably a trace. Ordinarily the heaviest losses occur in home gardens although sometimes local and severe attacks have been seen in commercial plots, especially near Wheeling. The disease is kept in check mainly by rotation. This year in Calhoun County a 50 per cent infection occurred.

PHOMA LINGAM (Tode) Desm. (blackleg). Usually this disease is distributed widely although most of the damage has been on young plants. In 1928 the disease was not seen.

PLASMODIOPHORA BRASSICAE Wor. (club root). Losses from this cause have never been more than a trace because the disease has been confined to scattered areas. In 1928 club root was not observed.

CANTALOUPES

BACILLUS TRACHEIPHILUS EFS. (bacterial wilt). A 25 per cent loss was reported in 1921 and 1 per cent in 1927. No data have been preserved for other years but it is apparently the most important disease of this crop.

COLLETOTRICHUM LAGENARIUM (Pass.) Ell. & Hals. (anthracnose). Fragmentary data would imply that the prevalence of anthracnose had been erratic in the past. The highest recorded loss (10 per cent) occurred in 1927. This year the disease was observed on scattered leaves.

MACROSPORIUM CUCUMERINUM Ell. & Ev. (leaf blight). This leaf spot was reported as the cause of serious trouble in 1904 by Sheldon (22). No reports are available since that time. The disease was not observed in 1928.

PSEUDOPERONOSPORA CUBENSIS (Berk. & Curt.) Rostew. (downy mildew). The first report of the disease on this host is that of Sheldon (22, p. 125) in 1904 who found a slight infection in one locality. In 1914 a field near Morgantown was severely affected.

*RING SPOT (virus) (4057). This seems to be the first collection of this disease under natural conditions. (Cfr. under pumpkin).

CARROT

*CERCOSPORE APII-CAROTAE Pass. (leaf blight) (3085). A few infected plants found.

*MACROSPORIUM CAROTAE E. & E. (leaf blight) (3067). The disease was seen in one small truck garden where it had caused considerable damage to the foliage.

CELERY

CERCOSPORE APII Fresen. (early blight). Severe in several localities but the loss was undoubtedly slight.

SEPTORIA APII Rostr. (late blight). Moderate amounts were seen on local produce in market.

CUCUMBER

BACILLUS TRACHEIPHILUS EFS. (bacterial wilt). Considered to be the most important disease of cucumbers. In many localities it is impossible to grow the crop. In 1928 a few diseased plants were seen in greenhouse crops.

COLLETOTRICHUM LAGENARIUM (Pass.) Ell. & Hals. (anthracnose). Occasionally this disease has caused severe losses in cucumbers but ordinarily the fungus is observed merely as a leaf parasite. In 1928 only scattered cases occurred.

MACROSPORIUM CUCUMERINUM Ell. & Ev. (leaf spot). In 1904 Sheldon (22, p. 125) reported the occurrence of this leaf spot. He considered the cucumber to be resistant and the cantaloupe to be quite susceptible. No observations on the disease are available since that time.

PSEUDOPERONOSPORA CUBENSIS (Berk. & Curt.) Rostew. (downy mildew). In a few years this organism has been rather prevalent, but ordinarily it is found not at all or only rarely. Losses have always been insignificant. In 1928 only a few diseased leaves were found.

MOSAIC (virus). Judging from the scant reports in the past this disease occurs but rarely and then is only slightly significant. One severe case was reported in 1928.

EGGPLANT

PHOMOPSIS VEXANS (S. & S.) Harter (fruit spot). Common on produce in markets and causing unsightly decay.

HORSERADISH

CERCOSPORE ARMORACIAE Sacc. (leaf spot) (4054). Severe in scattered localities.

LETTUCE

*SEPTORIA LACTUCAE Pass. (leaf spot) (3027). Loss a trace. The organism occurred mostly on older leaves.

ONION

MOSAIC (undet.) This disease observed in scattered localities in 1917 and 1918 and reported to the Plant Disease Survey as "mosaic" is considered now by N. J. Giddings to be the trouble recently described by Melhus and Henderson (14) as the yellow dwarf of onion.

PARSNIP

CERCOSPORE APII PASTINACAE Farl. (leaf spot) (3267, 4071). The disease was observed commonly in various localities. The damage was negligible.

PEA

MYCOSPHAERELLA PINODES (B. & B.) Stone (blight) (2037). A moderate amount was observed on local produce in the markets.

PEPPER

*PHYLLOSTICTA CAPSICI Speg. (leaf spot) (3291). This disease occurred in one locality. The organism probably is the same as that described as Phyllosticta sp. by Halsted (11, page 360). In the files of the Plant Disease Survey at Washington, there are reports of a Phyllosticta leaf spot from Georgia, Alabama, and New Jersey.

Saccardo in Sylloge 16, page 840 cites spores of P. capsici with measurements of 7-8 x 3-4 microns. In the West Virginia material they measured 5-6 x 2-3 microns.

POTATO

ACTINOMYCES SCABIES (Thax.) Gues. (scab). Scab occurred mostly in home gardens but even there it did not cause appreciable loss.

ALTERNARIA SOLANI (E. & M.) J. & G. (early blight). The entire loss for the state was probably not more than a trace. The majority of loss occurred in Cobblers and in plants on low ground.

BACILLUS PHYTOPHTHORUS Appel (black leg). Black leg was generally distributed; particularly on early varieties, i.e., Irish Cobblers. According to counts during July, the loss averaged about 0.5 per cent but the inclusion of early losses would run the estimate to 1 per cent.

CERCOSPORA CONCORS (C.) Sacc. (leaf spot). Occasionally this leaf spot has occurred slightly in Tucker County at high altitudes. Not found in 1928.

CORTICIUM VAGUM Berk. & Curt. (scurf, stem rot). As usual, this disease occurred early as stem rot. It caused a loss of perhaps a trace.

FUSARIUM OXYSPORUM Schl. (wilt). Loss, a trace. This year, wilt occurred scattering and doubtless was traceable to seed infection.

PHYTOPHTHORA INFESTANS (Mont.) D By. (late blight). The loss for the state was 10 per cent. In the past, late blight has been erratic in its behavior. In many years it has appeared too late to cause severe damage but some years the losses have run as high as 25 per cent of the crop.

In 1928, the blight appeared first in the higher mountain sections and spread rather slowly. Ordinarily, it is severe and general by August 1, but this year conditions for infection seemed to be erratic. By July 15, scattered, unsprayed fields were severely blighted and in many cases the crop was reduced 50 to 75 per cent. In the commercial fields generally the losses were reduced to the minimum by proper spray applications. An unusual condition was noted, - that in most cases the unsprayed plants were killed early but that the tubers did not rot. This, of course, reduced the percentage of loss but resulted in uniformly small sized tubers.

HOPPERBURN Loss, 5 per cent. During July, hopperburn was general and rather severe on unsprayed fields. In commercial fields, the regular spray schedules controlled the trouble effectively.

LEAF ROLL (virus). Loss, a trace. Leaf roll was scattered throughout the state. In one plot of about 2 acres at least 50 per cent of the plants were affected. In some cases, infected plants appeared in fields planted with certified seed.

MOSAIC (virus). Loss, a trace. The disease was unusually evident but this may be explained in part by the fact that the ordinary masking effect was eliminated by the low temperatures which prevailed during the spring season.

Affected plants were reported rather frequently, even in fields planted with certified seed.

Table 86. Estimated percentage losses from potato diseases in 1928.

Disease	Percentage loss	Disease	Percentage loss
Mosaic	Trace	Fusarium wilt	Trace
Leaf roll	Trace	Tinburn and hopperburn	5
Late blight	10	Early blight	Trace
Rhizoctonia	Trace	Other diseases	Trace
Blackleg	1	All diseases (total)	16

PUMPKIN

*CERCOSPORA CUCURBITAE E. & E. (leaf spot) (4059). A slight occurrence was found in one locality in the Eastern Panhandle.

*ERYSIPHE CICHORACEARUM DC. (powdery mildew). Slight in various localities.

*RING SPOT (virus) (4056). One plant affected with ring spot was noted in a home garden. The leaves were smaller and the vines shorter than the adjoining healthy plants. (Cfr. Wingard (26)). (See also cantaloupe)

RHUBARB

ASCOCHYTA RHEI E. & E. (leaf spot) (3068, 3326). Common but not important.

RUTABAGA

*CERCOSTORELLA ALBO-MACULANS E. & E. (3371). Slight in one locality.

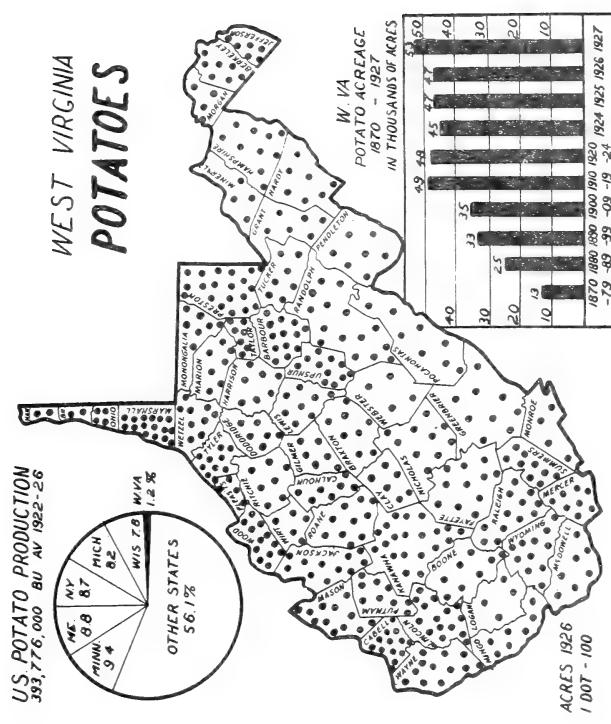


Fig. 16. Production statistics for potatoes.
(After Gibbs, 8)



SAGE (SALVIA OFFICINALIS)

*CERCOSPORA SALVIECOLA Tharp. (leaf spot) (3289). Evidently this is the first report of this organism on the cultivated sage. It caused a leaf spot of minor importance in a garden.

SALSIFY (TRAGOPOGON PORRIFOLIUS)

*SPORODESMIUM SCORZONERAE (?) Aderh. (blight) (4070, 4145, 4146, 4147, 4148, 4150, 4153). In 1928, in the Eastern peninsula near Inwood, a small truck garden was affected by a trouble which had killed nearly 10 per cent of the plants. The incipient stages appeared as elongated, brownish spots on the leaves. Evidently, as the condition progressed, the leaves became entirely blighted and then died. In the final stages, all or nearly all of the leaves were dead and the root was either undeveloped or else blackened. The latter condition may have been due to an invasion by the fungus from the leaves.

In 1929, R. J. Haskell and the author made a further survey through Maryland and Pennsylvania and determined that apparently the same disease occurred in practically every planting of salsify. During that season, however, the damage was slight.

The fungus fruits abundantly on the dead leaves. So far as can be determined from the literature, this may be the same, or at least similar to, the organism mentioned by Chupp (5, p. 475-476) and Aderhold (1) as occurring on black salsify (Scorzonera hispanica) in Germany. The spores of the American material correspond morphologically to those represented by Aderhold but the spore measurements do not agree. Those given by Aderhold are 50-75 x 13.5-16.5 microns while in the American collections they are 18-54 x 7.5-8 microns. Whether this difference in size implies merely the physiological variation of a single species or the existence of two species can be determined only by further study.

Incidentally, Bolle (4) considers the genus Sporodesmium to be untenable and in the group Phaeodictyae distinguishes Alternaria, Macrosporium and Stemphylium.

SQUASH

PSEUDOPERONOSPORA CUBENSIS (B. & C.) Rest. (downy mildew). In scattered years, downy mildew has been abundant in various localities but it was not seen in 1928.

TOMATO

ALTERNARIA SOLANI (E. & M.) J. & G. (early blight). Before 1924, losses from early blight were reported frequently as high as 10 per cent. In recent years, however, losses have been considered to be only a trace or 1 per cent. In 1928, the disease was observed only to a slight extent in fields near Morgantown.

BACTERIUM SOLANACEARUM EFS. (bacterial wilt). During the past 15 years bacterial blight has been observed only in 6 or 7 scattered cases. It was not seen in 1928.

COLLETOTRICHUM PHOMOIDES (S.) Chest. (anthracnose). The disease was observed only on local produce in the market. Only a few fruits were affected.

FUSARIUM LYCOPERSICI Sacc. (Fusarium wilt). Not seen in 1928. In past years, it seems to have been only slightly important and confined to scattered localities.

PHYTOPHTHORA INFESTANS (M.) D.B. (late blight). Not observed in 1928. Before 1923, the disease was reported often as occurring late in the season with considerable damage to the crop.

SEPTORIA LYCOPERSICI Speg. (leaf spot) (3066, 3328). Loss, 15 per cent. This was the most severe disease of the tomato. It occurred widely and by September 1 practically all plants had lost half their leaves. In many cases, the vines were killed outright. The larger commercial growers suffer little loss because they expect to harvest only a few crops before the spring market is flooded and the price drops. The damage usually comes after the larger growers have completed their harvest. The smaller growers, however, who maintain wayside markets and the home gardener suffer considerable loss.

BLOSSOM-END ROT (non-par.). Not observed in 1928. In some years, the losses have been estimated at 2 per cent.

MOSAIC (virus). As usual, mosaic appeared only in a few scattered plants.

Table 87. Estimated percentage losses from tomato diseases in 1928.

Disease	: Percentage	::	Disease	: Percentage
	: loss	::		: loss
Septoria blight	: 15	::	Other diseases	: 0
Fusarium wilt	: 0	::	All diseases (total)	: 15
Early blight	: 0	::		

TURNIP

PERONOSPORA PARASITICA (P.) D By. (downy mildew) (4061). Only a few diseased leaves observed in one field.

WATERMELON

COLLETOTRICHUM LACENARIUM (Pass.) Ell. & Hals. (anthracnose). Loss, 5 per cent.

FUSARIUM NIVEUM EFS. (wilt). Losses are generally prevented by crop rotation. This year about 10 per cent loss occurred.

DISEASES OF ORNAMENTALS

AESCULUS HIPPOCASTANUM L. (HORSECHESTNUT)

*UNCINULA FLEXUOSA Peck (powdery mildew) (4073). Severe and general.

ALTHAEA ROSEA L. (HOLLYHOCK)

*ASCOCHYTA ALTHAEINA Sacc. & Bizz. (leaf spot) (4030). Moderate.

PUCCINIA MALVACEARUM Bert. (rust) (2084). Moderate amounts were seen on volunteer plants.

AQUILEGIA SP. (COLUMBINE)

*ERYSIPHE POLYGONI DC. (powdery mildew) (4031). Infrequent.

BERBERIS THUNBERGII DC. (JAPANESE BARBERRY)

*BACTERIAL LEAF SPOT (undetermined) (3062). This disease was common at Morgantown where most plants were affected slightly.

CALLISTEPHUS CHINENSIS NEES. (CHINA ASTER)

FUSARIUM CONGLUTINANS CALLISTEPHI Beach (wilt) (3061). Many plantings were entirely blighted early in the season. Ten per cent of infected plants are estimated for the state.

YELLOWS (virus). Fully 50 per cent of the blossoms were ruined by yellows.

CASTANEA DENTATA (MARSH.) BORKH. (CHESTNUT)

ENDOTHIA PARASITICA (Murr.) Anders. (blight) (3020). Occurred commonly throughout the state, especially in wooded sections. Practically all young trees showed one or two blighted branches. Many older trees dead.

SEPTORIA OCHROLEUCA B. & C. (leaf spot) (3019). Slight.

CHRYSANTHEMUM SP.

SEPTORIA CHRYSANTHEMELLA Cav. (leaf spot) (4078). Slight.

COSMOS SP.

*PHOMOPSIS STEWARTII Peck (canker) (4139). At Morgantown, affected plants were common in one garden.

CRATAEGUS OXYACANTHA L. (ENGLISH HAW)

*BACILLUS AMYLOVORUS (Burr.) Trev. (fire blight) (2028). An old tree was severely attacked with twig blight.

* PHYLLOSTICTA RUBRA Peck (leaf spot) (4116). Found once.

DELPHINIUM SPP. (PERENNIAL LARKSPUR)

BACTERIUM DELPHINII (EFS) Bryan (black spot). Rather common and destructive.

*ERYSIPHE POLYGONI DC. (powdery mildew). On a few plants decided stunting occurred.

GLADIOLUS SP.

FASCICULATA

*ALTERNARIA FASCICULATA (C. & E.) Jones & Grout. (leaf blight) (4033).

HEDERA HELIX L. (ENGLISH IVY)

*PHYLLOSTICTA CONCENTRICA (Sacc. (leaf spot) (2024). This disease occurs widely on the host which is planted commonly. Ordinarily the blighted plants are partially defoliated. A twig blight, seemingly due to the same organism, was observed. During the summer, pycnidia formed abundantly but it was difficult to find spores. These develop after the leaves fall to the ground.

HELIANTHUS GIGANTEUS L. (GIANT SUNFLOWER)

*PUCCINIA HELIANTHI-MOLLIS (Schw.) Jack. (rust). (3266). Plants moderately attacked.

*SEPTORIA HELIANTHI E. & K. (leaf spot) (3265). Severe and general. Commonly half of the leaves were killed and frequently in southern localities plants were killed.

IRIS SP.

BACILLUS CAROTOVORUS Jones (soft rot). At Charleston, this disease was troublesome, especially on a white variety. Semesan treatment was practiced.

DIDYMELLINA IRIDIS (Desm.) Hoehn. (leaf spot) (2076). Slight occurrence.

LATHYRUS ODORATUS L. (SWEET PEA)

*ERYSIPHE POLYGONI DC. (powdery mildew). Plants were infected rather late in the season.

MONARDA DIDYMA L. (RED MINT)

*PUCCINIA MENTHAE Pers. (rust) (3287). Found in one garden.

MORUS RUBRA L. (MULBERRY)

*PHLEOSPORA MACULANS (Bereng.) All. (leaf spot) (4092). Slight.

PAEONIA SP. (PEONY)

*ALTERNARIA SP. (leaf spot) (3294). A few plants were found bearing this organism in leaf spots.

BOTRYTIS PAEONIAE Gud. (blight) (2088). The leaves were commonly attacked and on some varieties there was considerable bud blight.

*PHYLLOSTICTA COMMONSII E. & E. (leaf spot) (4142).

PELARGONIUM SP. (GERANIUM)

*STEM CANKER (undetermined) (2082). In one greenhouse, there occurs annually a stem canker on the pink varieties. The canker occurring at the surface of the soil is filled with a whitish mycelial growth and there is a tendency toward callus formation. The causal organism was not determined.

PHLOX SP.

K
*CERCOSPORE OMPHAEOIDES E. & H. (leaf spot) (3184). Slight.

ERYSIPHE CICHORACEARUM DC. (powdery mildew). Moderate.

PLATANUS OCCIDENTALIS L. (SYCAMORE)

GNOMONIA VENETA (Sacc. & Speg.) Kleb. (anthracnose). Affected trees were found rather generally throughout the state. The effects of the disease seem to be slow. A tree is weakened gradually by the continued killing of branches and loss of leaves. After a number of years of such infection, the foliage will be scanty and the branches and twigs sparse, even on large plants. Such trees succumb each year to the fresh attacks of the fungus.

*SEPTORIA PLATANIFOLIA Cooke (leaf spot) (3090). Syn. (Phleospora multamaculans Heald & Wolf, p. p.; Phyllosticta platani Sacc. & Speg.). The West Virginia collection resembles in part the Ravenel, Fungi Amer. Exsicc. 27 (Septoria platanifolia) and in part, the type and co-type collections of Heald and Wolf. The Phyllosticta is closely associated with the Septoria and, in light of the work of Higgins, Klebahn, and others with related groups on other hosts, there is small doubt of the relation here.

POPULUS ALBA L. (SILVER POPLAR)

*MARSSONINA POPULI (Lib.) Sacc. (leaf spot) (3186, 3388). All trees seen were attacked rather severely. Twig blight was common.

POPULUS CANADENSIS MOENCH. (CAROLINA POPLAR)

*MARSSONINA POPULI (Lib.) Sacc. (leaf spot) (4066). Most trees are severely attacked with subsequent defoliation in late fall.

PRUNUS GLANDULOSA THUNB. (FLOWERING ALMOND)

*SCLEROTINIA FRUCTICOLA (Wint.) Rehm. (twig blight) (2078). In one locality, a plant showed severe twig blighting.

PSEDFRA QUINQUEFOLIA (L.) GREENE (VIRGINIA CREEPER)

CERCOSPORA AMPELOPSIDIS Peck (leaf spot) (3056).

QUERCUS SP. (OAK)

*GNOMONIA VENETA (Sacc. & Speg.) Kleb. (anthracnose). Infected trees were first noticed during August. In many cases, they were severely damaged, but in general, most trees showed only a few blighted twigs.

ROBINIA PSEUDACACIA L. (BLACK LOCUST)

FOMES RIMOSUS Bark. (wood rot) (4155). Common throughout state.

*PHLEOSPORA ROBINIAE (Lib.) v. H. (3102, 3122, 3348, 3153). The locust was severely attacked and heavy defoliation resulted.

BROOMING DISEASE (undetermined). The disease (recently described by Hartley and Haasis, 12) was noted by F. J. Schneiderhan near Winchester, Virginia. Fresh material was sent to Dr. L. O. Kunkel for further study. It was later observed in several localities in West Virginia (See Pl. IV).

Apparently the same disease was reported from West Virginia to the Plant Disease Survey in 1920 by J. L. Sheldon. His record is as follows: "Typical witches' broom from stumps and exposed roots. I found insect larvae in some of them."

ROSA SP. (ROSE)

CERCOSPORA ROSICOLA Pass. (leaf spot). The disease is widespread. Ramblers are sometimes entirely defoliated.

DIPLOCARPON ROSAE Wolf. (black spot) (2039). Greenhouse plants are generally attacked and defoliation is the cause of considerable concern among growers.

LEPTOSPHAERIA CONIOTHYRIUM (Fuck.) Sacc. (cane blight) (2091).

*LEPTOTHYRIUM ROSARUM Cooke (flyspeck) (3188).

*PHOMA SP. (tip blight) (2089). Found once on Crimson Rambler.

*PHOMOPSIS SP. (canker) (2066).

PHYSALOSPORA MALORUM (Pk.) Shear (die-back) (2090). On a white rambler this organism caused a moderate blighting of canes.

*YELLOWS (undetermined) (2048). In a patch of escaped roses by a roadside a number of plants were affected by yellows.

SORBUS AUCUPARIA L. (MOUNTAIN ASH)

*VALSA LEUCOSTOMA (Pers.) Fr. (die-back) (3118). Slight damage.

SPIRAEA SP. (SPIREA)

*LEPTOTHYRIUM VULGARE (Fr.) Sacc. (flyspeck) (3187). In one nursery, the leaves were specked with this organism.

VIBURNUM SP.

*CERCOSPORA VARIA Pk. (leaf spot) (3189). Nursery plants commonly show a moderate attack.

*CLADOSPORIUM SP. (leaf spot) (3189 b).

*MONOCHAETA SP. (leaf spot) (3189 a).

DISEASES OF NON-CULTIVATED PLANTS

ACER SP.

*Cladosporium humile Davis (3310, 3242, 3169). Severe on seedlings.

*Phyllosticta sp. (3219). Severe on seedlings.

ACER PENNSYLVANICUM L.

Rhytisma punctatum (Pers.) Fr. (3351).

ACER RUBRUM L.

*Cladosporium humile Davis (3354, 3172). Severe and generally distributed.

ACER SACCHARUM MARSH.

*Gloeosporium saccharinum E. & E. (3033).

*Phleospora aceris (Lib.) Sacc. (3394).

ACTINOMERIS ALTERNIFOLIA

*Gloeosporium exitiosum Dearnness pro tem (3238). Collected at Racine September 6. New species according to Dearnness.

AESCOLUS GLABRA WILLD.

*Guignardia aesculi (Pk.) Stewart (3081).

AGRIMONIA GRYPOSEPALA WALLR.

Pucciniastrum agrimoniae (Schw.) Tranz. (3246).

AGROPYRON REPENS (L.) BEAUV.

*Cladosporium herbarum (Pers.) Lk. (2029).

*Phyllachora graminis (Pers.) Fuck. (4103).

AGROSTIS ALBA L.

Fusarium parasiticum E. & K. on Puccinia graminis (3106).

AILANTHUS GLANDULOSA

*Gloeosporium ailanthi Dearn. & Barth. (3191).

ALNUS RUGOSA (DU R.) SPR.

*Gnomoniella tubiformis (Tode) Sacc. (3344).

AMBROSIA ARTEMISIIFOLIA L.

*Albugo tragopogonis (Pers.) Gray (3073).

AMBROSIA TRIFIDA L.

*Cercospora racemosa E. & M. (3014, 3260).
Erysiphe cichoracearum DC. (3282).

AMELANCHIER CANADENSIS (L.) MEDIC.

*Dimerosporium collinsii (Schw.) Thuem. (4029).

AMPELOPSIS SP.

*Linospora pseudeae Dearnness protemp. (4011). Specimen sent to J. Dearnness who determined it tentatively as a new species. Collected at Parsons, September 15.

AMPHICARPA MONOICA (L.) ELL.

*Colletotrichum amphicaruae Dearnness (3123). Specimen sent to J. Dearnness, London, Ontario who determined it as a new species. Collected at Clarksburg, September 3.

*Synchytrium decipiens Farl. (2079).

ANEMONE VIRGINIANA L.

*Puccinia anemones-virginianae Schw. (2095).

APOCYNUM CANNABINUM L.

*Cylindrosporium apocyni E. & E. (3182).

ARALIA SPINOSA L.

*Cercospora atromaculans E. & E. (3316, 4007). General.

ARCTIUM MINUS BERNH.

Puccinia bardanae Corda. (4111).

ARISTOLOCHIA MACROPHYLLA

*Ovularia aristolochiae Dearnness. (3387). Collected at Kerens, September 9. New species according to Dearnness.

ARTEMISIA SP.

*Albugo tragopogonis (Pers.) Gray (3048).

ASCLEPIAS INCARNATA L.

Cercospora clavata (Ger.) Pk. (3078, 3299).

ASCLEPIAS SYRIACA L.

*Botrytis hypophylla E. & K. (4006 b).
*Cercospora clavata (Ger.) Pk. (3374).
*Phyllosticta cornuti E. & K. (4006).
Uromyces asclepiadis Cke. (4045).

ASIMINA TRILOBA DUNAL

*Phleospora asiminae E. & K. (3196, 3232, 3297). Often severe causing heavy defoliation.

ASTER SP.

- Coleosporium solidaginis (Schw.) Thum. (3333, 4093).
Ophiiodothis haydeni (B. & C.) Sacc. (3055).
Puccinia asteris Duby. (4090).

ASTER MACROPHYLLUS L.

- *Coleosporium solidaginis Thum. (3358).

ASTER MULTIFLORUS AIT.

- *Ophiiodothis haydeni (B. & C.) Sacc. (3228).
*Septoria atropurpurea Pk. (3231).

ASTER PUNICEUS L.

- Coleosporium solidaginis Thum. (3334).

BETULA LENTA L.

- *Microsphaera alni (Wallr.) Wint. (3376).
*Phyllosticta betulae E. & E. (3377). Severe in some localities causing moderate defoliation.
Septoria microsperma Pk. (3256).

BIDENS VULGATA GREENE

- *Plasmopara halstedii (Farl.) B. & D. T. (3177, 4084).
*Sphaerotheca castagnei Lev. (4087, 3361).

BROMUS JAPONICUS

- *Septoria bromi Sacc. (2047).

BROMUS PURGANS L.

- Puccinia clematidis Lagerh. (3174).

CACALIA ATRIPLICIFOLIA

- *Septoria cacaliae E. & K. (3385).

CAREX LURIDA WAHL.

- *Puccinia sambuci (Schw.) Arth. (3397).

CASTANEA DENTATA (M.) BORK.

- *Leptothyrium castaneae (Spr.) Sacc. (3309).
Microsphaera alni (Wal.) Wint. (4128).

CELTIS OCCIDENTALIS L.

- *Pseudoperonospora celtidis (Waite) Wilson (4079, 4047). Evidently this is the first report of the fungus since the original discovery in the District of Columbia.

CERCIS CANADENSIS L.

- *Cercospora cercidicola Ell. (3257, 3164, 3243). Seedlings severely attacked.

CHENOPODIUM ALBUM L.

- Cercospora dubia (R.) Wint. (3032).
*Peronospora effusa (G.) Rabh. (3375, 2030).

CHRYSANTHEMUM LEUCANTHEMUM L.

*Septoria chrysanthemi All. (2019).

CICUTA MACULATA L.

*Cylindrosporium cicutae E. & E. (3108).

CIRCAEA LUTETIANA L.

Puccinia circaeae Pers. (3378, 3249).

CIRSIUM SP.

*Septoria cirsii Niessl. (3345).

CLEMATIS VIRGINIANA L.

*Cylindrosporium clematidis E. & E. (4014).

CONVOLVULUS SP.

Septoria convolvuli Desm. (4043).

CONVOLVULUS SEPIUM L.

Puccinia convolvuli (Pers.) Cast. (2075)

Septoria convolvuli Desm. (3180, 2007).

COREOPSIS TRIPTERIS L.

*Coleosporium inconspicuum (Long) Hedg. (3208).

CORNUS FLORIDA L.

*Septoria cornicola Desm. (3161).

CRATAEGUS SP.

Gymnosporangium germinale (Schw.) Kern (4118).

*Leptothyrium pomi (Mont. & Fr.) Sacc. (4129, 4130). Common; associated with sooty blotch.

*Phyllosticta solitaria E. & E. (4003). Moderate in some localities.

CYPERUS STRIGOSUS L.

*Phyllachora cyperi Rehm. (3167).

Puccinia cyperi Arth. (3192).

DACTYLIS GLOMERATA L.

*Scolecotrichum graminis Fuckel (2092, 3031).

DANTHONIA COMPRESSA AUCT.

*Balansia hypoxylon (Pk.) Atk. (2060). Plentiful.

DANTHONIA SPICATA (L.) BEAUV.

*Ustilago residua Clint. (2097, 2059).

DESMODIUM CANESCENS (L.) DC.

Uromyces hedsyari-paniculatae (Schw.) Farl. (3126, 3111, 3278, 3115).

DIOSPYROS VIRGINIANA

Cercospora diospyri? (3076).

DIPSACUS SYLVESTRIS MILL.

*Cercospora elongata Pk. (3080).

ELEPHANTOPUS CAROLINIANUS WILLD.

Coleosporium elephantopodis (S.) Thum. (3239).

ELYMUS CANADENSIS L.

Phyllachora graminis (Pers.) Fuckl. (4009).

ERECHTITES HIERACIFOLIA (L.) RAF.

*Septoria erichtitis E. & E. (3320).

ERIGERON SP.

*Cercosporella cana (Pass.) Sacc. (4107).

ERIGERON RAMOSUS (WALT.) B.S.P.

*Cercosporella cana (Pass.) Sacc. (2056). Common and severe.*Leptothyrium punctiforme B. & C. (3027).*Puccinia asterum (Schw.) Kern (2052).

EUPATORIUM PURPUREUM L.

*Ascochyta compositarum Davis (3141, 4027).*Erysiphe cichoracearum DC. (3330). Severe.

EUPHORBIA HETEROPHYLLA L.

*Uromyces proeminens (DC.) Pass. (4102).

EUPHORBIA PRESLII GUSS.

*Uromyces proeminens (DC.) Pass.

FRAGARIA SP.

Ramularia tulasnei Sacc. (3342, 2025).

FRAXINUS AMERICANA L.

*Piggotia fraxini B. & C. (3121).*Vermicularia herbarum West. (3248). Uncommon.

GALIUM PARISIENSE L.

*Cercospora galii E. & H. (4010).

GAYLUSSACIA BACCATA (WANG.) KOCH

*Pestalozzia guepini Desm. (3216). Common, causing defoliation.

HAMAMELIS VIRGINIANA L.

*Gonatobotryum maculicolum (Wint.) Sacc. (4020). Common in some localities.

HELIOPSIS HELIANTHOIDES (L.) SWEET

*Puccinia helianthi Schw. (3125).

HEUCHERA AMERICANA L.

*Pestalozzia heucherae Tehon & Dan. (3250).*Vermicularia dematium (P.) Fr. (4143).

HOLCUS LANATUS L.

Puccinia coronata Cda. (3396).

HYDRANGEA ARBORESCENS L.

Pucciniastrum hydrangeae (B. & C.) Arth. (3255, 3311). This host generally is affected severely.

HYPERICUM PUNCTATUM LAM.

*Uromyces hyperici-frondosi (Schw.) Arth. (3367).

IMPATIENS SP.

*Mycosphaerella impatientis (P. & C.) House (3117).

IMPATIENS BIFLORA WALT.

*Gloeosporium impatientis Anders. (3337).

IPOMOEA HEDERACEA JACQ.

Albugo ipomoeae-panduranae (F.) Sw. (3109).

JUGLANS NIGRA L.

Gnomonia leptostyla (Fr.) Ces. & DeN. (3199, 3308). Severe defoliation was commonly encountered, especially on young plants.

JUNCUS EFFUSUS L.

Uromyces junci-effusi Syd. (3099).

JUNCUS TENUIS WILLD.

Darluca filum (Biv.) Cast. on Uromyces silphii (3077).

LACTUCA SP.

*Pleospora lactucicola E. & E. (4119).

LACTUCA SCARIOLA L.

*Septoria lactucae Pass. (3015).

LEPIDIUM CAMPESTRE (L.) R. BR.

*Albugo candida (P.) Kuntze (2016).

LESPEDEZA REPENS (L.) BART.

Uromyces lespedezae-procumbentis (Schw.) Curt. (3114, 3143).

LESPEDEZA VIRGINICA (L.) BRITT.

*Uromyces lespedezae-procumbentis (Schw.) Curt. (3129).

LIRIODENDRON TULIPIFERA L.

*Cylindrosporium cercosporoides E. & E. (3258). Severe defoliation in southwestern part of state.

Phyllosticta liriodendrica Sacc. (3312). Severe leaf spotting.

LYCIUM HALIMIFOLIUM MILL.

*Cercospora lycii E. & H. (4100).

*Puccinia globosipes Pk. (4101).

MAGNOLIA ACUMINATA L.

*Cercospora magnoliae E. & Hark. (3206). Severe and common on young plants.

Phyllosticta magnoliae Sacc. (3370).

MALVA ROTUNDIFOLIA L.

*Cercospora althaeina Sacc. (4083).

MENTHA SPICATA L.

Puccinia menthae Pers. (3116).

MIMULUS RINGENS L.

*Septoria mimuli E. & K. (3096, 3237).

MUHLENBERGIA MEXICANA (L.) TRIN.

*Phyllochora graminis (Pers.) Fuck. (3285).

Puccinia hibisciata Kellerm. (4114).

MUHLENBERGIA SCHREBERI GMEL.

Puccinia hibisciata (Schw.) Kellerm. (4105).

NYSSA SYLVATICA MARSH

*Phyllosticta nyssae Cooke (3203, 3211, 4001). Severe and general.

OENOTHERA SP.

*Septoria oenotherae West. (3147, 2036).

PANICUM CLANDESTINUM L.

*Septoria graminum Desm. (2096).

PANICUM DICHOTOMIFLORUM MICH.

*Cercospora fusimaculans Atk. (3154).

PANICUM GATTINGERI NASH

*Puccinia emaculata S. (4089).

PANICUM HUACHUCAE ASHE

Phyllochora puncta (S.) Orton (3089).

PANICUM LATIFOLIUM L.

*Phyllochora puncta (S.) Orton (3355).

PANICUM MICROCARPON MUHL.

*Phyllochora puncta (S.) Orton (4008).

PHLEUM PRATENSE L.

Ustilago striaeformis (W.) Niessl. (2003).

PHYSOCARPUS OPULIFOLIUS (L.) MAX.

*Pestalozzia monochaetoides S. & E. var. parasitica (4015).

PHYTOLACCA DECANDRA L.

*Mosaic (2077). Plants severely attacked throughout the state.

PLATANUS OCCIDENTALIS L.

- *Pestalozzia funerea Desm. (3200). Common on young growth.
- *Septoria platanifolia Cooke (3259). Moderate defoliation occurred.

POA COMPRESSA L.

- *Ustilago striaeformis (W.) Niessl. (2061).

PODOPHYLLUM PELTATUM L.

- Septoria podophyllina Fk. (2072).

POLYGONUM SP.

- *Peronospora polygoni Thum. (2071).

POLYGONUM AVICULARE L.

- *Uromyces polygoni (F.) Fckl. (3181, 3185).

POLYGONUM HYDROPIPER L.

- *Cercospora hydropiperis (Thum.) Speg. (3363).

POLYGONUM PENNSYLVANICUM L.

- *Septoria polygonorum Desm. (3166).

POTENTILLA CANADENSIS L.

- *Phragmidium potentillae-canadensis Diet. (3247, 2002).
- *Ramularia arvensis Sacc. (3357).

POTENTILLA MONSPELIENSIS L.

- *Ramularia arvensis Sacc. (2051).

PRUNELLA VULGARIS L.

- *Septoria ~~prunellae~~ E. & H. (3252).
- PRUNELLAC

PRUNUS AMERICANA M.

- *Leptothyrium pomi (Mont. & Fr.) Sacc. (3283). General occurrence.
- *Phyllosticta prunicola (Opiz.) Sacc. (3205). Severe defoliation was noted in many cases. (See apple).

PRUNUS PENNSYLVANICA L.

- *Cocomyces hiemalis Hig. (3362, 3398, 3363). Defoliation severe.
- Plowrightia morbosa (S.) Sacc. (3364). Common.

PRUNUS SEROTINA EHR.

- Cocomyces hiemalis Hig. (3163, 3331). Defoliation severe, especially on young plants.

- *Phyllosticta prunicola (Opiz.) Sacc. (3335). Moderate, especially on upper leaves. (See apple).

- *Pleurotus ostreatus Fr. (3380).

PSEDERA SP.

- *Plasmopara viticola (B. & C.) B. & deT. (4013). Common.

PYCNANTHEMUM FLEXUOSUM (WALT.) B.S.P.

- *Puccinia menthae Pers. (3135).

PYCNANTHEMUM PYCNANTHEMOIDES (L.) FER.

- *Puccinia menthae Pers. (3241).

PYRUS CORONARIA L.

Bacillus amylovorus (B.) Trev. (fire blight). Severe examples were seen.

Gymnosporangium juniperi-virginianae Schw. (3132).

*Illosporium malifoliorum Sheld. (leaf spot) (3133). Moderate.

*Marssonina coronariae Sacc. & Dearn. (3330). Caused severe defoliation.

*Phyllosticta prunicola (Opiz.) Sacc. (3332). In some cases severe defoliation occurred. (See apple).

*Venturia inaequalis (Cke.) Aderh. (2068). Severe defoliation.

QUERCUS SP.

*Actinopeltite japonica Sacc. (3218, 3350). Severe on seedlings.

*Gnomonia veneta (S. & S.) Kleb. (3336).

QUERCUS ALBA L.

Microstroma alba (Desm.) Sacc. In 1920, J. L. Sheldon reported the occurrence of this disease to the Plant Disease Survey. He stated that several "brooms" were to be found on a single tree. He had observed the condition over a period of years and finally secured diseased leaves showing the fungus. In 1928, the writer visited the location and photographed the original tree which still retained three of the "brooms" (Pl. V) of varying sizes. The intermediate size (see arrow in plate) measured about five feet in length.

Polyporus sulphureus (Bull.) Fr. (3379). Several trees attacked by this fungus were seen.

QUERCUS MARILANDICA MUEH.

*Actinopeltite japonica Sacc. (3207). Severe on seedlings.

QUERCUS PRINUS L.

*Actinopeltite japonica Sacc. (3212).

RHUS SP.

*Wilt (undetermined). Plants with wilted terminals were observed commonly throughout the state. Similarly affected plants have been observed in Iowa and New York.

RHUS COPALLINA L.

*Cercospora rhuina C. & E. (3136, 3098). Severe defoliation occurred.

RHUS TOXICODENDRON L.

*Uromyces toxicodendri Berk. & Rav. (4038). Common and plentiful in some localities.

Typhina

RHUS TYRINA L.

*Pezizella lythri (Desm.) Shear & Dodge (3346, 3104). Moderate defoliation.

RUBUS SP.

*Botrytis cinerea Auct. (4017).

*Caeoma nitens Burr. (2004).

*Cercospora rubi Sacc. (3130, 3131).

*Kuehneola uredinis (Link) Arth. (3305).

RUBUS HISPIDUS L.

*Mycosphaerella rubi Roark (2055).

RUBUS ODORATUS L.

*Phyllosticta rubi-odorati Bub. & Kab. (3319).

SALIX SP.

*Cylindrosporium salicinum (Pk.) Dearn. (3234, 4022, 3150). Severe defoliation throughout the state.

Rhytisma salicina (Pers.) Fr. (4024).

SAMBUCUS CANADENSIS L.

*Cercospora depazeoides (D.) Sacc. (3095, 3324).

SCROPHULARIA MARILANDICA L.

*Septoria scrophulariae Westd. (3236).

SETARIA VIRIDIS (L.) BEAUV.

*Piricularia grisea (C.) Sacc. (4042). Common.

SMILAX HISPIDA M.

*Cercospora smilacina Sacc. (3170, 3100).

*Sphaeropsis cruenta (Fr.) Gilm. & Arch. (3175, 3137).

SOLIDAGO SP.

Coleosporium solidaginis (Schw.) Thum. (3091, 2008).

*Rhytisma solidaginis S. (3197, 3016).

SOLIDAGO CAESIA L.

*Coleosporium solidaginis (S.) Thum. (3353).

SOLIDAGO JUNCEA AIT.

*Leptothyrium tumidulum Sacc. (3159).

TECOMA RADICANS (L.) JUSS.

*Cercospora sordida Sacc. (3280).

TEUCRIUM CANADENSE L.

*Cercospora teucrii (S.) E. & K. (4044).

TINIARIA SCANDENS (L.) Small.

*Puccinia polygoni-amphibii P. (4021).

Ustilago anomala Kunze (4154).

TRIDENS FLAVUS (L.) HITCHC.

Puccinia windsoriae Schw. (4067).

TRIFOLIUM HYBRIDUM L.

*Pseudopeziza trifolii (Biv.) Fuck. (3028)

Uromyces hybridii W. H. Davis (3225).

ULMUS AMERICANA L.

*Mycosphaerella ulmi Kleb. (3392). Moderate.

ULMUS FULVA MICHX.

*Gnomonia ulmea (Sacc.) Thum. (4019, 3295). Slight.

VACCINUM PENNSYLVATICUM LAM.

*Pucciniastrum myrtilli (Schum.) Arth. (3215, 4002). General and severe.

VACCINUM STRAMINEUM L.

*Rhytisma vaccinii (S.) Fr. (3209). Severe on some plants.

VERNONIA NOVEBORACENSIS WILLD.

Coleosporium carneum (Bosc) Jackson (3064).

VITIS SP.

*Guignardia bidwellii (E.) V. & R. (3352). Severe on fruits and leaves.

VITIS AESTIVALIS MICHX.

*Plasmopara viticola (B. & C.) B. & DeT. (3315).

VITIS BICOLOR LE C.

*Guignardia bidwellii (E.) V. & R. (3018).

XANTHIUM CANADENSE MILL.

*Puccinia xanthii Schw. (4108).

B I B L I O G R A P H Y

1. Aderhold, R. Ueber eine bisher nicht beobachtete Krankheit der Schwarzwurzeln. Arb. Biol. Abt. f. Land- und Forstw. 3: 493-440. 1903.
2. Anderson, F. J. et al. Check list of diseases of economic plants in the United States. U.S.D.A., Dept. Bull. 1366, pp. 111, 1926.
3. Arthur, J. C. et al. Uredinales. North American Flora 7: 83-848. 1907-1927.
4. Balle, P. C. Die durch Schwärzepilze (Phaeodictyae) erzeugten Pflanzenkrankheiten. Mededeel. Phytopath. Lab. Willie Com. Scholten 7: 1-77. 3 pl. 1924.
5. Chupp, C. Manual of vegetable-garden diseases. pp. 647. 1925. New York.
6. Clinton, G. P. Ustilaginales. North American Flora 7: 1-82. 1906.
7. Farlow, W. G. and A. B. Seymour. A provisional host-index of the United States, I-III. 219 pp. 1888-1891. Cambridge.
8. Gibbs, B. West Virginia Farm Statistics 1870-1928, 55 pp. Issued jointly by United States Department of Agriculture and West Virginia Department of Agriculture. (Unnumbered publication) Charleston, W. Va. May 1928.
9. Giddings, N. J. Potato and tomato diseases. West Virginia Agr. Exp. Sta. Bull. 165: 4-24. 20 fig. 1917.

10. Giddings, N. J. and A. Berg. Apple rust. West Virginia Agr. Exp. Sta. Tech. Bull. 154: 5-73. 1915.
11. Halsted, B. D. Fungous diseases of various crops. 11th Ann. Rpt. New Jersey Agr. Exp. Sta. 1890: 360. 1891.
12. Hartley, Carl and F. W. Haasis. Brooming disease of black locust (Robinia pseudacacia). Phytopathology 19: 163-166. 2 fig. 1929.
13. Jones, F. R. The leaf spot diseases of alfalfa and red clover caused by the fungi Pseudopeziza medicaginis and P. trifolii, respectively. U.S.D.A. Dept. Bull. 759. 38 pp. 1919.
14. Melhus, I. E. and W. J. Henderson. The yellow dwarf of onions. Phytopathology 19: 86. 1929.
15. Millspaugh, C. F. The living flora of West Virginia. West Virginia Geol. Surv. V (A) Pt. I: 1-150. 1913.
16. Millspaugh, C. F. and L. W. Nuttall. Flora of West Virginia. Field Col. Museum, Bot. Ser. Publ. 9, Vol. 1(2): 69-276. 1896.
17. Reed, H. S. and C. H. Crabill. Notes on plant diseases in Virginia observed in 1913 and 1914. Virginia Agr. Exp. Sta. Tech. Bull. 2: 37-58. 17 fig. 1915.
18. Roberts, J. W. Experiments with apple leaf spot fungi. Jour. Agr. Res. 2: 57-65. 1 pl. 1914.
19. _____ "Target canker" of apples and pears. Phytopathology 17: 735-738. 1 fig. 1927.
20. Scott, W. M. and J. B. Rorer. Apple leaf spot caused by Sphaeropsis malorum. U.S.D.A., Bur. Pl. Ind. Bull. 121, Pt. V: 46-53. 2 pl. 1908.
21. Sheldon, Clara F. The Erysiphaceae of West Virginia. Thesis of West Virginia University, pp. 68. 3 pl. 1900. (Unpublished).
22. Sheldon, J. L. Diseases of melons and cucumbers during 1903 and 1904. West Virginia Agr. Exp. Sta. Bull. 94: 121-138. 8 fig. 1904.
23. _____ A report on plant diseases of the state. West Virginia Agr. Exp. Sta. Bull. 96: 71-99. 6 pl. 1905.
24. _____ Another leaf spot fungus of the apple. Torreya 8: 139-141. 1908.
25. Sherwood, E. C. and L. M. Peairs. Orchard spraying in West Virginia. W. Va. Agr. Exp. Sta. Circ. 54: 3-31. 1929.
26. Wingard, S. A. Hosts and symptoms of ring spot, a virus disease of plants. Jour. Agr. Res. 37: 127-153. 23 fig. 1928.

EXPLANATIONS OF PLATES

II

Stages in development of spot and in disintegration of apple leaves caused by Illosporium malifoliorum.

III

- A. Defoliation of apple tree caused by Illosporium malifoliorum.
- B. Severe defoliation in pear orchard, caused by Fabraea maculata.

IV

Witches' broom of Quercus alba caused by Microstroma alba.

V

Brooming disease of black locust. Terminal portions of two affected branches.

PLATE 2

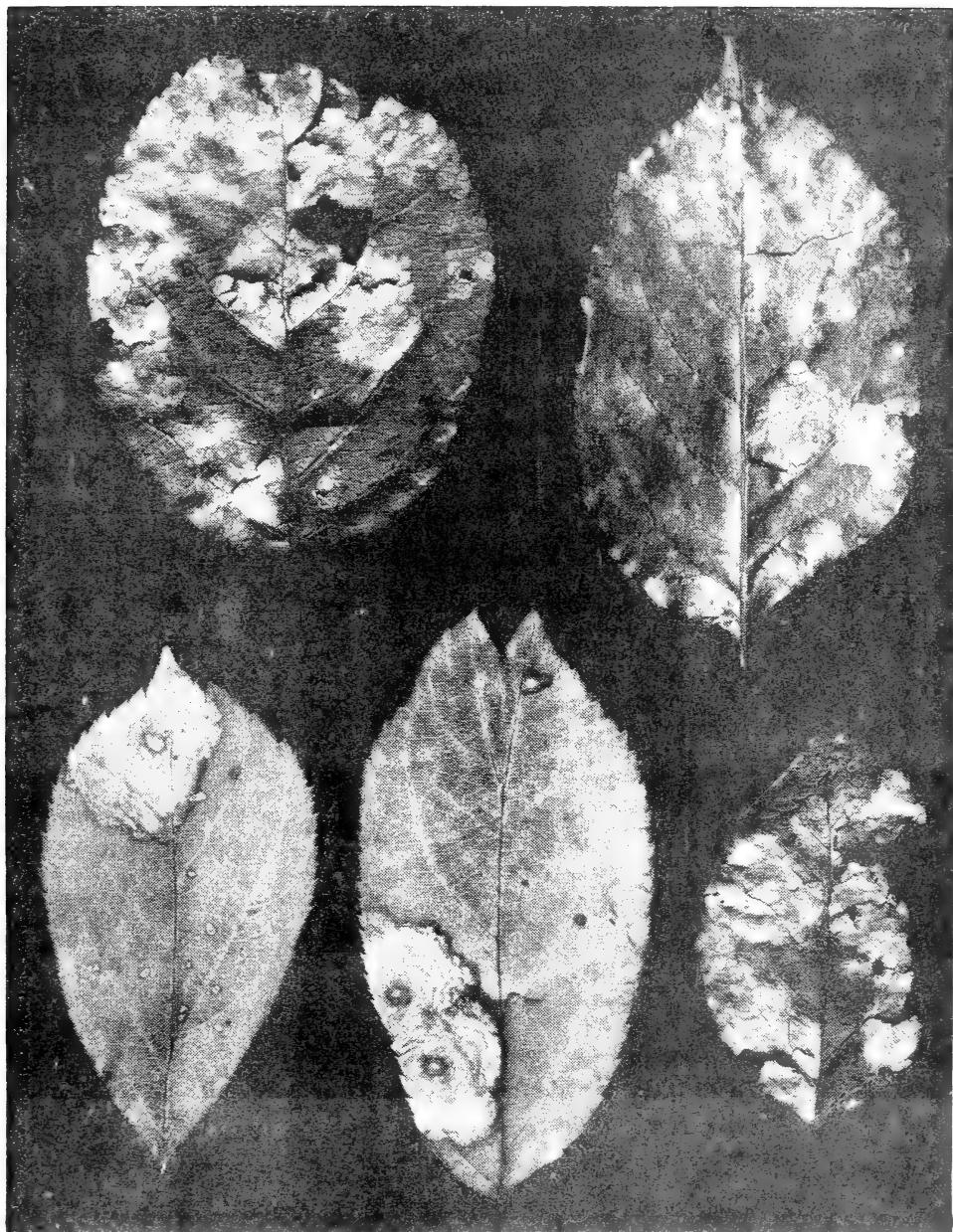
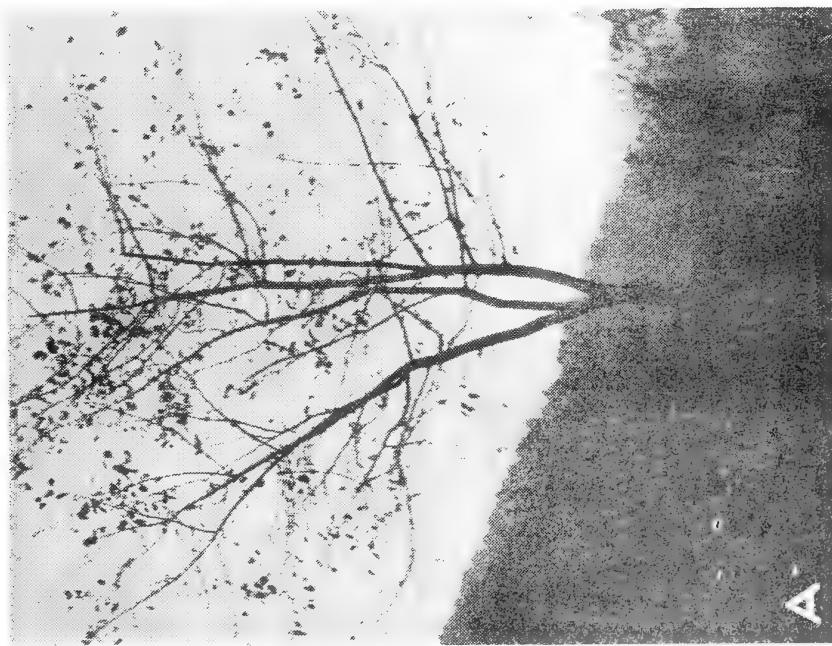
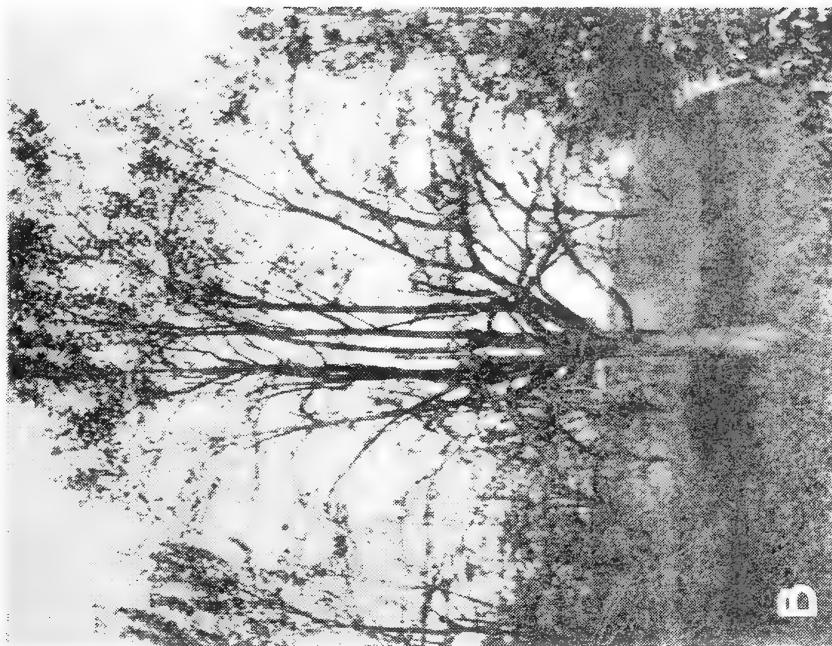




PLATE 3



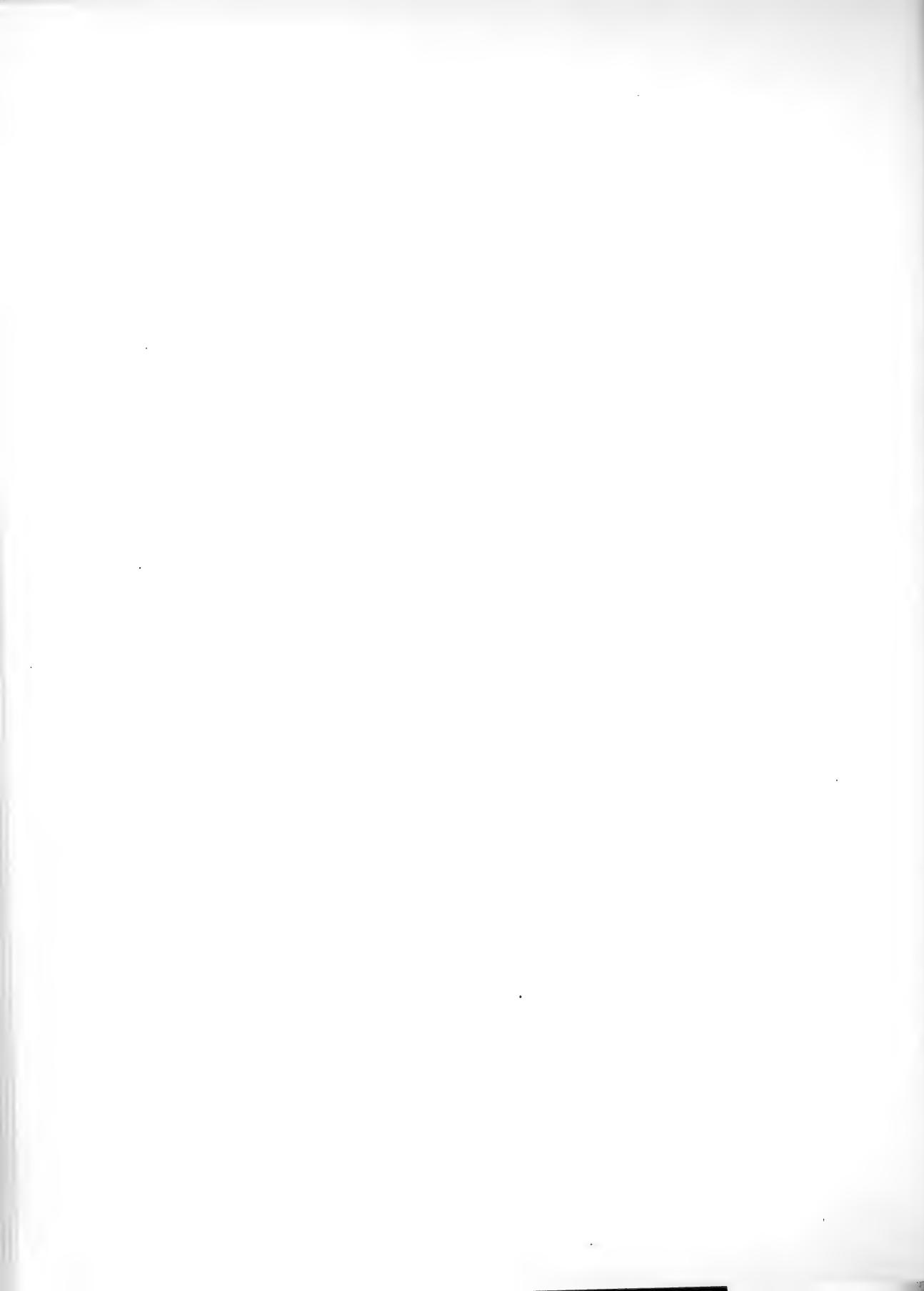


PLATE 4



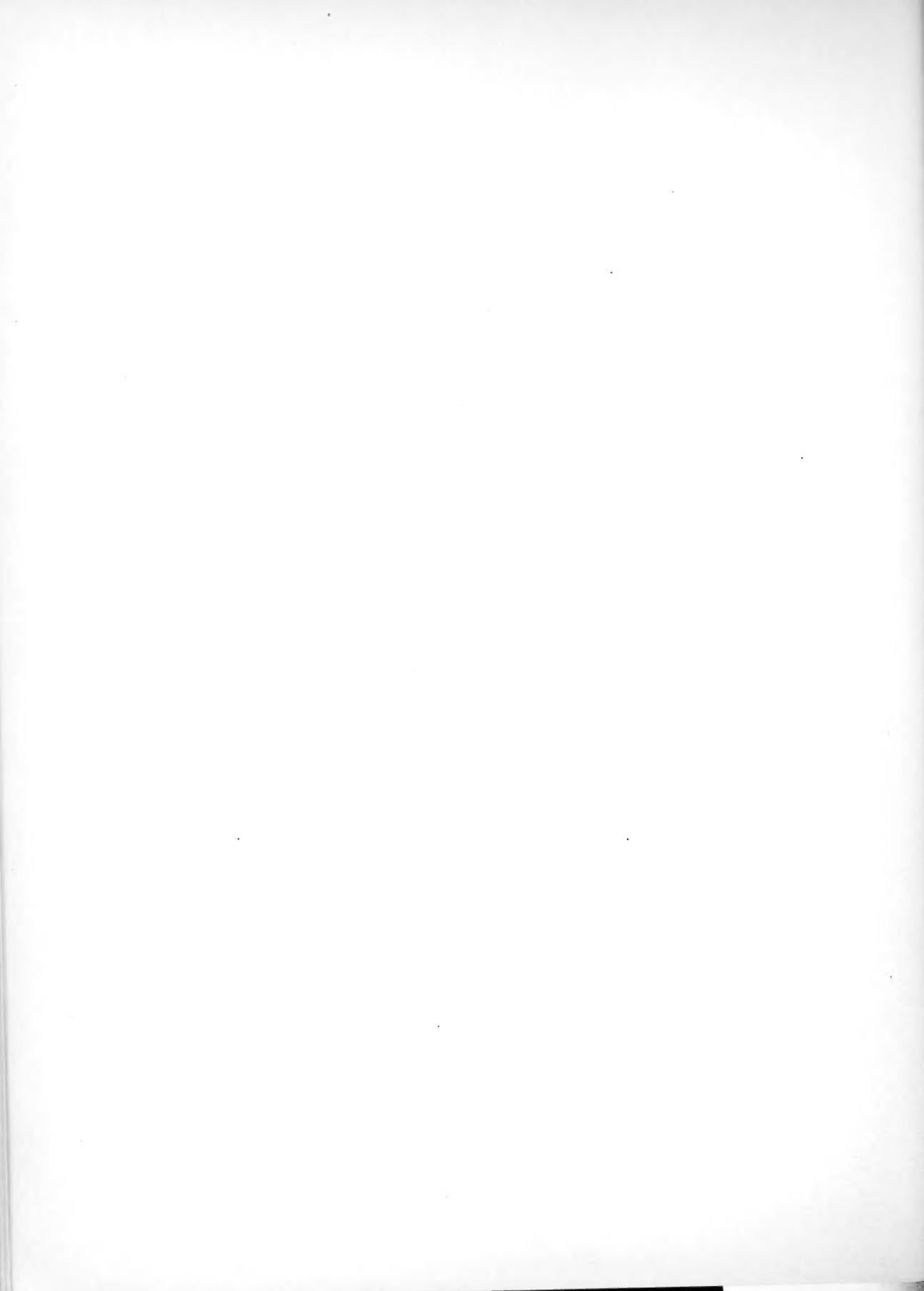


PLATE 5



